REPORT RESUMES

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A LARGE LIFE INSURANCE COMPANY AUTOMATES. WORKFORCE IMPLICATIONS OF COMPUTER CONVERSION. AUTOMATION PROGRAM REPORT, NUMBER 3.

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THIS WAS ONE OF 20 DEMONSTRATION PROJECTS INITIATED IN 11 STATES IN 1961-63 TO GAIN EXPERIENCE WITH LABOR MARKET PROBLEMS ARISING FROM CHANGING TECHNOLOGY AND MASS LAYOFFS. THE FUNDAMENTAL AIM WAS TO COMBINE ACTION AND RESEARCH TO DEMONSTRATE WHAT THE STATE EMPLOYMENT SERVICE COULD DO IN AREAS WHERE THE LABOR MARKET WAS RAPIDLY CHANGING. END-OF-YEAR PERSONNEL DATA FROM 1956 AND 1962 FOR ALL HOME OFFICE EMPLOYEES WAS COLLECTED FROM A LARGE LIFE INSURANCE COMPANY PAYROLL TO OBTAIN AN OVERALL PICTURE OF THE SITUATION BEFORE AND AFTER COMPUTER CONVERSION. THE DIVISIONS OF THE ESTABLISHMENT MOST AFFECTED BY THE COMPUTER WERE STUDIED BY PREPARING AND COMPARING STAFFING PATTERNS AND INDIVIDUAL WORKER INFORMATION RECORDS BEFORE AND IMMEDIATELY AFTER EACH UNIT WAS CONVERTED TO ELECTRONIC DATA PROCESSING. ASSUMING THE INSURANCE COMPANY STUDIED IS REPRESENTATIVE OF OTHER LARGE COMPANIES IN WHICH "PAPER WORK" IS THE END PRODUCT, SOME CONCLUSIONS WERE -- (1) THE PROPORTION OF CLERICAL WORKERS WILL INCREASE AT A SLOWER RATE THAN IN RECENT YEARS, (2) THE PROPORTION OF PROFESSIONAL WORKERS WILL INCREASE AT A FASTER RATE, (3) PRODUCTIVITY PER CLERICAL WORKER IS INCREASING RAPIDLY IN AUTOMATED ESTABLISHMENTS, (4) THE NUMBER OF CLERICAL POSITIONS OPEN TO WORK FORCE ENTRANTS IN THE LIFE INSURANCE INDUSTRY IS DECLINING, AND (5) TRADITIONAL POSITIONS WILL NOT BE AVAILABLE FOR FUTURE HIGH SCHOOL GRADUATES AT THE PRESENT VOLUME. THE APPENDIXES INCLUDE STAFFING TABLES AND HOME OFFICE EMPLOYMENT. (SL)

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ITED STATES EMPLOYMENT SERVICE

Automation Manpower Services
Program

Demonstration Project No. III

AUTOMATION PROGRAM

Report No. 3

U. S. DEPARTMENT OF LABOR
W. WILLARD WIRTZ, *Secretary*

MANPOWER ADMINISTRATION

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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A LARGE LIFE INSURANCE COMPANY AUTOMATES

WORKFORCE IMPLICATIONS OF COMPUTER CONVERSION

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FOREWORD

Twenty Automation Manpower Services demonstration projects were started in eleven States during 1961-63, to gain experience with labor market problems arising from changing technology and mass layoffs. The projects are financed and guided by the United States Employment Service and conducted by affiliated State Employment Services.

The fundamental aim is to combine action and research to demonstrate what the Employment Service can do in rapidly changing labor markets.

In this general context, the projects are designed to:

1. Provide direct intensified personal service to affected workers to promote occupational reorientation, minimize duration of unemployment, and to experiment with training and retraining techniques.

2. Analyze changing jobs and staffing patterns to gain information about evolving job content and training requirements in establishments affected by technological change.

3. Conduct labor market and related research in conjunction with these projects to develop procedures and methods that will assist the Employment Service in carrying out effective manpower actions in advance of the development of problems.

While the projects cover a broad range of remedial manpower actions--from the use of training funds to development of aptitude tests for new occupations--not every project includes the whole range of possible actions. Each project is tailored to the manpower problem presented by the particular case, whether it involves layoffs, in-plant workforce adjustments, reduced hiring, or the need for all-out community action.

As each of the present and future projects reaches a point at which summarization of experience and findings is possible, reports will be prepared for this series of Automation Program Reports, so that the project results may be disseminated throughout the public Employment Service system, and used to improve manpower planning and operations.

Louis Levine, Director
United States Employment Service

BUREAU OF EMPLOYMENT SECURITY, Robert C. Goodwin, Administrator

PREFACE

The Wisconsin State Employment Service, in collaboration with the Automation Manpower Services Division of the United States Employment Service, has focused the attention of its Project on Automation and Technological Change on a large insurance company. This establishment, already one of the most efficient in the country in terms of costs per premium dollar, has been engaged for several years in computerizing hand-and-machine office procedures.

The case may be regarded as a model of enlightened personnel policy by a company careful of its community image, and animated at all stages of several years of preliminary planning by a determination not only to reassure, but also to protect the work force in being when the computer was delivered.

We appreciate the extensive cooperation given by personnel of the life insurance company and other firms studied. Without this cooperation the research, and this report in particular, would not have been possible.

Staff of the International Business Machine Corporation local office expended considerable time and effort to provide invaluable advice and information for our project. For this service we feel very indebted.

Finally, we wish to thank the members of the Manpower Services Division of the United States Employment Service and members of various departments within the Wisconsin State Employment Service who gave their time in aiding our studies.

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INTRODUCTION

On November 7, 1961, the Wisconsin State Employment Service (W.S.E.S.) proposed a demonstration project to carry out a case study on the impact of automation on the home office of a large life insurance company. The project proposal was based on the original assumption that extensive and immediate worker displacement would occur upon installation of a large scale computer. Project staff were to ascertain how Employment Service techniques and facilities -- in cooperation with community training resources, management, and worker groups -- could be focused on the problems of workers affected by automation or technological change.

The assumption of mass layoffs proved false; there were, in fact, no layoffs of permanent status home office employees. Following are a few factors that reduced the possibility of layoffs. Policy-oriented data processing functions were drawn into the home office from general agencies located throughout the United States. The company management's concepts of computer application were revised as time went on. The company purchased additional newly developed hardware. And of utmost importance was the high rate of attrition at this firm.

Even though there were no immediate layoffs, the work force implications of the computer in this case study are significant. The greatest impact is on current work force entrants. Positions are being reduced despite increased business volume, and company projections indicate this trend will continue. Early in the period of conversion to the computer, the company stated a policy that no layoffs of permanent home office personnel would occur. Attrition, plus on-the-job training of workers who had to be transferred, were the means of implementing this policy.

The method of work chosen by the project staff was to adopt the conventional tools and techniques available to Employment Service analysts. These tools included, for instance, the "Dictionary of Occupational Titles" (D.O.T.) descriptions and coding structure , and traditional job analysis tools such as staffing and job analysis schedules. In addition, labor market information and the local area skill survey were analyzed to relate trends at this particular insurance company to those of the local labor market. To avert any potential personnel dislocation, the insurance company was offered W.S.E.S. counseling, testing, and placement services to smooth problems of inter-company transfer or to alleviate hardship of any layoffs.

From this single case study approach generalizations applicable to the present or future impact on the local work force of other business computer installations were to be formed. Project staff felt, however, that in order to project findings to a larger universe, the technological change under this particular case study should be compared with changes in other establishments. Consequently we had to ask ourselves:

Are the effects of change in our case study similar to those effects in other financial institutions and in manufacturing industries?

What are management's concepts of the new technologies and their application? and,

What is the technological status of any organization prior to change?

A local area computer-use survey was attempted. It was only partially successful. But the inability of local office employer relations staff to complete the survey was in itself valuable information. It forced a realization that traditional Employment Service employer contacts were inadequate because:

(1) employer relations representatives could not acquire sufficient background information in a short orientation session to ask additional pertinent questions or to interpret answers, and

(2) employer personnel staff often had no background in electronic data processing and were not consulted in long-range planning.

This led to several subsidiary studies. One study, resulting in the publication of Automation Project Report Number Two , was made after a major local manufacturer installed a large-scale business computer with automatic data collecting and communicating equipment. Project staff made a detailed analysis of worker characteristics of the manufacturer's laid-off employees (both clerical and professional) who registered with the district WSES office. These worker characteristics were compared to equivalent data derived from a sampling of other job applications in corresponding files of the same office. The similarities and differences of the manufacturer's laid-off workers and applicants of the corresponding files were summarized. In this manner project staff attempted to forecast the "employability" of the applicants and form a general statement of the effects on a work force that similar changes in methods, systems and procedures would have when adopted by other manufacturing industries.

Other studies involving computer conversion were undertaken. These studies involved group interviews based on a structured outline developed by the project staff. Reports on each company were prepared after completing interviews with insurance companies and banks. These companies were consistent in forecasting a decreased need for clerical help in proportion to clerical work volume. All, except for the manufacturers, felt able to handle clerical overstaffing by reduced hiring and the process of attrition. The sample of manufacturers studied had to resort to the further step of clerical layoffs.

One broadly diversified but fairly small insurance company had already imposed a total freeze on clerical hiring, although only a proportion of their work had been programmed for the computer. The freeze was described as being temporary but of an indefinite duration. In previous years the company had hired relatively large numbers of girls graduating from two local high schools.

In still another interview held at a forge shop, it was found that logical analysis of systems and enforcement of the "one writing"* rule had been in effect prior to installing the computer. At this firm, a far greater personnel dislocation was caused by the analysis of systems and the "one writing" rule than by the computer installation.

Project staff visited another company reported as probably the first manufacturing firm in the United States to achieve a totally integrated, computer-oriented management system. In this firm there was already a reduction in the number of clerical workers in proportion to production output. We were informed that this proportion would not increase in the future and were told that one of their forecasts indicated the possibility of handling a 100% production increase with only 16% extra office staff.

As project activities continued, an increasing number of requests for information were received. Below are listed some of the services extended by the project staff:

> Before the institution of a two-year (post high school) course in data processing, project staff reviewed and suggested changes in the proposed curriculum.
>
> A local vocational school requested advice on the current state of "the art of microminiaturization." Information on current and projected employer requirements for jobs in this field and suggestions for integration of training in micro-processing with current course content were also requested.
>
> Occupational and salary information was provided for a local county government unit to facilitate their setting up an electronic data processing department.
>
> Because of employer demand, the D.O.T. Supplement "Occupations in Electronic Data Processing" was reprinted and distributed. A revision of this brochure was necessary because of changes since 1959 in electronic data processing equipment and programming. A project member was "loaned" to the Occupational Analysis Field Center. Among his duties were the study of occupational areas of information retrieval and numerical control of machine tools.

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* One example of the "one writing" rule would be setting up a form which, from the initial point of capturing data, can be used in several areas of a firm and therefore eliminate duplication of capturing data during other phases of the work flow.

Another project member assisted in the multi-state effort to establish norms for Console Operator, Programer, and Systems Analyst for the General Aptitude Test Battery (G.A.T.B.).

Project members assisted interviewers in obtaining more information both for data processing job orders and for providing services to applicants who have data processing backgrounds.

A study of movement from blue-collar to white-collar occupations, based on local office records, was prepared to assist a university research project. The local office found this study very useful.

A university study on the impact of the computer on the labor force was reviewed by project staff.

Requests for occupational information from school guidance officers and students were forwarded to us by a computer manufacturer.

A training session on data processing was presented to some of the local office interviewers.

Finally, project staff participated in the development of materials for training sessions on "the hard-to-place applicant."

Though several aspects of the Wisconsin research project have been mentioned, the primary concern of this report is the life insurance company. The report attempts to give a history of the firm and to describe the computer and its impact on the subject insurance company.

"THE CONVERSION TO COMPUTERS: A SUMMARY"

1. A temporary increase in work force occurred during conversion to EDP.

Increased work load resulting from conversion of existing records to EDP input form and operation of parallel (dual) methods, systems and procedures, requires an increased work force or overtime. At the insurance company both an increased work force and overtime resulted from the conversion. Redundant operations tend to prolong the increased work load.

2. The firm used a temporary help contract agency during conversion.

"Some extra employees were needed in the actual conversion process to 'get over the hump'".* Instead of hiring all additional personnel needed, the company used temporary help from contract agencies, thereby reducing the possibility of layoffs once the temporary increase in work load diminished.

3. A special position was created to handle the manpower problems of conversion.

The appointment of a full-time Personnel Coordinator, Data Processing, was made to anticipate and carry through the job assignments which automation would cause. "His first job was to interview all those likely to be affected by EDP...It was also (his) job to familiarize himself with the impact of automation...(and to familiarize himself with)...operational applications of EDP involving intra-departmental work on systems and forms."*

4. Employees were kept informed of changes.

Orientation lectures, personal interviews, company house organ, and local newspapers were used.

5. No layoffs of permanent personnel occurred.

Over a period of three years, nine employees were laid off by the insurance company. While most of these workers were employed for several years, they were always considered temporary workers by the the employer, had been paid on an hourly basis, and did not receive company fringe benefits. When the temporary nature of their work was over, they were released. Layoffs of these workers were not the result of a lack of work. Some of the laid-off workers could not pass company physical examinations; others wanted part-time work only. It must be noted, however, that during this period and after, many additional permanent workers were hired by this insurance company.

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* Insurance company house organ

6. Attrition reduced the work force, resulting in no major unsolvable transfer problem.

"The total change-over has taken more time than was originally calculated, and in this time the normal process of voluntary terminations has cut down the number of employees released for transfer elsewhere."* Less than twenty-five inter-departmental transfers were channeled through the Personnel Coordinator, Data Processing.

7. No major unsolvable hiring problems occurred.

Originally, existing company personnel were selected and trained as programers, systems analysts, and computer operators. After the initial staffing, recruitment of programer trainees began from the outside.

8. No major unsolvable training problems occurred.

An already existing extensive training program adequately handled the new training requirements imposed by the conversion and the new systems, procedures and methods.

9. The time that conversion has taken is considerable.

The idea of converting equipment to electronic data processing was conceived in the early 1950's. As a result, an Electronics committee was named in 1954 which initiated a feasibility study in the first quarter of 1955. Consequently, the first agency began conversion to electronic data processing in May of 1959, and in September of 1962 the last agency converted to the new data processing.

10. An increase in the number of "specialists"-- staff, rather than line functions -- occurred, while no change in the number of "supervisors" (middle management) occurred.

The number of specialists increased from fifty-two at the end of 1956 to ninety at the end of 1962. The number of supervisors was slightly higher in 1962 than in 1956 but was equal to staffing at the end of 1955. Thus the total number of supervisors remained constant, with minor staffing fluctuations resulting from attrition, while the number of specialists increased 73%.

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* Insurance company house organ

11. The company procedures, systems and methods were and are more advanced than in many other insurance companies.

    A Procedures and Systems Division existed in the Comptrollers Department prior to conversion; since then, the unit has been upgraded from division to department level. Company methods were highly mechanized prior to the switch to the Electronic method. Thus a strictly rational system of work anaylsis and organization was already in existence.

12. IBM employees have been assigned to the firm since the installation of the first computer.

    This complemented the operations-oriented company Systems Analysts with the computer-oriented manufacturer's Systems Analysts. Thus, availability and application of existing and new soft-ware was constantly implemented by the interchange of computer-oriented and operations-oriented analysts.

13. The increase of labor productivity is significant and is continuing.

    Record-breaking increases in sales have generated a higher work load. Additional services to policyholders has also increased work load considerably. Work load has also been transferred to the home office from the company agencies. A lesser counter-move occurred; that is, processing of mortgage loans was decentralized to company branch mortgage loan offices. The additional home office work load has been handled by almost no increase in work force.

14. Hiring of new clerical personnel has been reduced.

    During most of the conversion period, hiring remained at a high level; however, new hiring of company clerical employees was 50% lower in 1962 than in 1956. (38% lower when considering those hired during the year and on the payroll at the end of the year)

15. The company will be less of a haven for high school graduates with no clerical training (specifically those who lack shorthand and/or typing ability) and apparently less of a haven for college dropouts.

    The number of new hires for non-entry routine clerical (with limited or no typing experience or training) was reduced from 274 in 1956 to 129 during 1962. The number of new hires for stenographic and secretarial work (including typists) increased from 29 to 44.

The number of college graduates hired increased from 27 in 1956 to 32 in 1962, despite an over-all decline in new hiring. The number of college drop-outs hired decreased from 41 in 1956 to 30 in 1962.

16. Conversion proceeded slowly, will be extended, and will be followed by constant refinement.

Refinement of procedures and systems continues indefinitely after the original change to the EDP method. In the strictest sense, there is no "After conversion to EDP."*

17. A minimum of one hundred and fifty clerical positions were eliminated in the company's agencies by the use of electronic data processing.

Processing of premiums was removed to the home office of the insurance company. Financial compensation to the agency offices for the processing of premiums ceased when processing was switched to the electronic method.

18. Despite an over-all employment increase, fewer clerical** workers were needed after conversion to E.D.P.

In affected areas an actual decline occurred in the number of clerical workers. Since workers in unaffected areas were not classified by D. O. T. code, and only company wage classifications were used, no company-wide comparisons are available.

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* "One of the more outstanding characteristics of a business application of a data processing system is that a business problem will remain open-end. Rarely, if ever, will any data processing solution to a major problem be completed from the viewpoint of the need for change, re-definition, and modification.."
Management Information Systems and the Computer
James D. Gallagher
American Management Association, Inc.

** D.O.T. definition of "clerical"

CONCLUSIONS

Our studies indicate the presence of a trend. If this insurance company is fairly representative of other large companies in which "paperwork" is the end product, then the proportion of workers in clerical occupations will increase at a slower rate than in recent years, and the proportion of professional workers will increase at a faster rate. On a trend extension basis, the possibility must be recognized that clerical positions can show a marked numerical drop (or at least a decline to a lower proportion of the total labor force than it holds at present). Productivity per clerical worker is increasing rapidly in automated establishments.

Again, assuming this company is representative, despite the formation of many new small companies and a rapid increase in sales, the number of clerical positions open to work force entrants in the life insurance industry is declining at present. This trend will continue unless the industry expands faster than is at present expected. The number of professional positions will continue to increase if the industry expands as expected. Sales positions are expanding rapidly at agencies not covered in this report on a home office.

The group most affected by the EDP-induced labor productivity increase is not the currently employed clerical employees. The high turnover of today's young work force moderates the present problems. The big impact will be on the new labor market entrants -- the girls who are in school now. When they graduate from high school and look for clerical work in the insurance industry, the traditional positions just will not be there -- at least not in anything like the volume of the last several years. And certainly not for girls who do not acquire in school specific clerical knowledge and ability to enhance their employability.

While new hiring channels for labor force entrants will undoubtedly be discovered over a period of time, the pressure for an immediate solution presses down with force. The number of eighteen year olds seeking employment will increase sharply this year, 1964. Nationwide, the increase is three quarters of a million -- twenty-two percent*.

Wisconsin high schools will graduate fourteen percent more students in 1964. The total will jump another ten percent in 1965 before leveling off at this higher rate**. Where will they be referred when they seek employment, if traditional sources are not able to take increased numbers?

* U. S. Census.
** WSES estimate.

METHODOLOGY -- Suggestions for others -- Structured interview outline

Two approaches were used for the study of this life insurance company.

One was to get complete end-of-year personnel data for 1956 and 1962 for all home office employees from company payroll runs to give us an over-all picture of "before and after" computer conversion.* This data was key punched for tabulating since manual methods of comparison will not work when the volume of data is this large. Tabular comparisons will be included in a subsequent report.

The other approach was to study only the divisions of the establishment most affected by the computer by "taking a picture" of the personnel in these units just before and immediately after each unit was converted to EDP. Staffing patterns were prepared for these units and individual worker information records prepared, even when individual jobs were not affected. Comparisons were done manually after converting company jobs to current D.O.T. titles and codes. This led to problems because most jobs in the clerical code area of the D.O.T. are not structured to indicate relative "skill level".

We suggest that any future research projects studying clerical jobs be trained in -- and use -- the functional occupation classification structure ("levels of complexity": data-people-things)** used by Occupational Analysis Field Centers, or that the projects set up their own occupational structure for the job area to be studied. While the second edition of the D.O.T. has been usable as a referral tool in job placements, it is entirely inadequate as a research tool for clerical and professional occupations; and the third D.O.T. edition will also be inadequate, unless the jobs in these areas are given some logical structure. Until then, it will be of little help in making significant comparisons of changes in the number of job positions or in determining the amount of job upgrading or downgrading that occurs. Our partially successful solution to the problem of salvaging some meaning from all our D.O.T. oriented staffing patterns was to group the jobs into the D.O.T. Part IV, Entry Occupational Classifications structure in order to identify major trends. This worked reasonably well, and the information gained is contained in later parts of this report.

The limitations of the present D.O.T. being what they are, we further suggest that any future research projects deviate from the traditional "occupation" or "people" centered approach of studying occupational change and consider using an alternative approach, which we feel will be more useful. Initially, study the systems and programing records, specifically the detailed work distribution data

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* Although, as our summary on the preceding page says, there really is no date that can be selected as "after" conversion, it is a continuing process.

** Appendix #1, Section 2.

(job breakdown), to find out what is going "on the computer" or is otherwise to be done differently from present ways of getting the work done. Then, using this information as a base, rate the changes in levels of work complexity, in process, and in time allocations. It is only at this time that we should start "thinking people" and study the occupations, positions, jobs, or what have you. This suggestion may mean that E. S. Occupational Analysts may have to train themselves in systems analysis, but this approach will get us away from working "after the fact" of change. We may not obtain absolutely reliable information; however, when compared to our present statistical methods and considering the inadequate structure of information on which these are presently based, results will be more meaningful.

Some interviewing of the employer's personnel staff and of unit heads was necessary to find out if several dozen jobs could be converted to D.O.T. codes. Only six job analysis schedules needed to be prepared; all of these were of jobs in the EDP area and were found to fit current D.O.T. professional and clerical codes. This low number was a surprise to us. We had incorrectly assumed that a large number of clerical jobs would have to be studied in detail because of the impact of the computer; however, the basic worker functions were not affected in many cases. The fact that workers now process computer-printed output, rater than data generated by some other means, did not necessarily affect what they did.

For more brief studies of other smaller insurance companies and of manufacturing plants that had installed business computers, a structured interview technique was developed. The structure kept project personnel from getting sidetracked into gathering interesting but irrelevant data and had the added advantage of leading us to the key person, often a systems analyst, who had the information we needed. Two or three of our staff participated in each interview because of the differing background required to get and relate the desired information about computer systems, product knowledge, labor market conditions, statistics, etc. One reason that the structured group interviews were successful is that we didn't go into them "cold". An average of two days was spent in checking Employment Service records (closed orders from the employer, etc.) and in studying other information sources, such as corporate annual reports, or a recent prospectus, and product catalogs. The structured group interview was the best "quickie" tool for information gathering that our project found during its two and one-half years of work.

The structured interview outline appears below. We include it in the hope it may be useful for others. This report is framed around most of the numbered headings. The sub-headings and parenthesized details were set up only for use as a checklist during interviews.

STRUCTURED INTERVIEW OUTLINE

B.I. Background Information (necessary prior to interview)
Company, person(s) interviewed, industrial code, number of employees, types of services or products produced, type of establishment (home office,

branch office, agency, job shop, production shop, etc.)

1. Structural changes (consider before, during, after, and future change -- Does an open-end situation exist? Was the data processing function placed under the comptroller or a department of administration?)
    a. Unit changes during conversion period
    b. Changes after conversion
    c. Future changes

2. Changes in employment

3. Changes in turnover

4. Degree of mechanization and efficiency prior to change

5. Changes in equipment and techniques, potential changes

6. Area of utilization of new equipment and techniques (% of total)

7. Changes in product line or service, potential changes

8. Changes in work load, productivity (type of business climate increasing, decreasing, or stable)

9. Amount and type of planning for the changes that affect employees
    a. Preparation in advance of change
    b. Stated company policy in effecting the changes (formal policy, examples from house organs, etc.)
    c. Timing and sequence of change
    d. Attitude of management, supervisors, staff workers toward the change

10. Training and retraining
    a. Amount of training or retraining given
    b. Method and facilities used in training or retraining given (on-the-job, classrooms, other)
    c. Unmet training needs
    d. Adequacy of local training facilities (public, private)
    e. Factors limiting transferability, trainability and retrainability (age, sex, marital status, size of family, education level and type, etc.)

11, Testing

12. Changes in worker status and characteristics
    a. Pay status
    b. Transfers
    c. Promotional possibilities
    d. Tenure
    e. Education
    f. Age
    g. Marital status
    h. Male-Female distribution
    i. Proficiency rating

13. Hiring changes
    a. Rate of hiring
    b. Source of applicants
    c. Length of employment
    d. Type of applicant hired (age, sex, marital status, education level and type skill requirements, prior work experience)
    e. Reason for hiring (need additional personnel, temporary, or permanent; inadequate training potential or skills in existing work force, etc.

14. Occupational changes (consider before, during, after and future change - Does an open-end situation exist?)
    a. Changes during conversion
    b. Changes after the conversion period
    c. Future occupational changes

15. Effect on agencies, branches (number of employees, type of employee, etc.)

16. Effect on other firms (suppliers, competitors, etc.)

17. Effect on Employment Service

BACKGROUND INFORMATION*

The subject of our study

The insurance company -- one of the largest life insurance companies in the United States -- is owned and controlled by its policyholders. It is a multi-state firm with a locally based home office and with branch loan offices and independent sales agencies throughout forty-six of the fifty states. The company offers standard life insurance policies such as ordinary life, term insurances such as 20-year pay and 30-year pay, endowments such as 20-year and endowments at age 60 and age 65. Since the fall of 1962, a new non-medical life insurance policy has been offered. Other related services offered by the company are annuities, pension plans, and key-man partnership and corporation policies.

How did Wisconsin become involved in a study of this insurance company?

The history of the Automation and Technological Change Project #3 goes back to the late summer of 1961. In response to letters and interviews with several local area companies, a questionnaire on "Automation and Technological Change" for each firm was completed, analyzed and finally forwarded to the national office of the United States Employment Service. The questionnaire was composed of various parts, including name and type of company; and several questions on present and anticipated automated installations and their implications on workers to be transferred, laid off, or retrained. One of the main questions was, "Would this employer cooperate in a demonstration project designed to ease the impact of the transition of his employees?"

One firm that responded (a life insurance company) had already installed some computers and was planning the installation of more advanced machines. (The questionnaire was dated September 11, 1961). Implications on a work force of over 1800 employees at this company would seem to be extensive. Would this company cooperate in a demonstration project? ...... Yes.

Wheels began turning and on November 7, 1961 a formal proposal for the project

* This section titled, "Background Information", and portions of the next section, "Structural Change", are taken from the several sources listed below and in some instances are actually taken verbatim:
    1. Subject Insurance Company house organs issued during 1960, 1961, and 1962.
    2. Interviews with the insurance company console operator and a 1401 computer operator.
    3. Interview with the insurance company sales representative.
    4. Previous automation project monthly progress reports.
    5. Correspondence on "Request and Proposal for the Automation and Technological Change Project".
    6. Other company records such as payroll runs.

had been drawn up by the Wisconsin State Employment Service. We proposed to study the "before, during and after Automation" of the company by preparing job analysis schedules for new and existing jobs. Further, we would attempt to provide labor market supply and demand information to fill the employer's needs and to explore local training facilities to assist training or retraining of company employees. In connection with training, retraining or job reassignment or layoff, the project personnel offered the services of our local Wisconsin State Employment office for counseling, testing, and placement problems. Finally, we would attempt to project our findings to other industries throughout the state.

Consultation held in Milwaukee with a member of the National Office led to the final draft (dated January 26, 1962) of project objectives and activities and the research was consequently under way. Whether the research would be of value seemed enhanced by the following considerations:

1. Why study a life insurance company? Insurance is one of the fastest growing businesses in the United States and is one of the large employers of clerical help.

New office technologies can have a greater long-run impact on the present and future clerical work force of a business such as insurance, where "paperwork" is the output, than in an industry where paperwork is an incidental factor in the fabrication of some other end product. Exceptions are possible, of course. Many manufacturing establishments traditionally have downgraded office functions to such an extent that fresh methods, work-simplification, and duplication-elimination studies can lead to immediate drastic clerical work force reductions.

The amount of impact always will vary. Insurance companies, as well as other businesses, have varied in degree of pre-computer mechanization, systems sophistication, and in work areas selected for mechanization. This is true even of companies of the same relative size and degree of product mix diversification.

2. What is an insurance company? Every insurance company is simply a central clearing house whose purpose is to distribute the cost of losses among a large number of persons. In return for deposits, called premiums, the company makes promises to pay money. In life insurance, not only does this principle remain true, but in addition the insured person is guaranteed a return on his investment (premiums) either to himself or his beneficiaries. Once a person becomes insured, his money is invested by the company. Earnings from these investments reduce the cost of life insurance for the policyowner.

Briefly stated, this is what a life insurance company does. How this is done varies among individual life insurance companies and is changing. We have attempted to interpret how this is done and how it is changing because of the adoption of Electronic Data Processing (EDP) at one such company -- a leader in the life insurance industry.

3. Why select this particular life insurance company? First, they let us. They made their personnel records an "open book" for the purpose of this study; they assigned liaison duties to a member of their personnel department and agreed to make other employees available for interview as necessary. Without this type of cooperation, a detailed case study approach to industrial change is almost impossible.

Second, they had retained enough old records of employment and individual transfers. This gave us a way to trace internal changes and to relate company changes to those of our local labor market.

Third, they had a formal company structure for work simplification, forms control, and clerical method, system and procedure* analysis long before the computer installation was planned. This gave them a framework for orderly conversion to the computer. They did not have to institute a "crash program" with all its temporary personnel dislocations in an effort to catch up to the rest of the industry. They were already industry leaders in labor productivity. From our point of view, this was an advantage because we could attempt to assess the long-term impact on their work force and the long-range impact on our local labor market and on State Employment Service functions, without the distortions that would have been induced by the study of a company plunging into electronic data processing without adequate planning, controls, or organization.

Fourth, for most jobs they have up-to-date position descriptions similar in content and format to the Employment Service "Job Analysis Schedules". Without descriptions somewhat like this as a take-off point, study of current worker functions in an establishment of this size would not have been possible. Actual observation of several hundred company jobs would have taken too much time.

Fifth, they were not newcomers to EDP. The computer was affecting their work force before we started our study. For instance, a small-scale computer was used in the mid-1950's and major applications of a larger IBM 705 system had been having an increasing effect on staffing since June 1, 1959.

Sixth, their concept of how EDP should be applied was different from that of some other companies. Instead of "starting small" (as, for example, converting only the new policy issue work to EDP), they planned a broad-spectrum change that would affect far more positions in more work areas.

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* See Appendix #1, Section #2

The Computer Installation Initiates Some Changes

Before the computer installation, clerical tasks were handled manually and by mechanical and electro-mechanical methods. In addition, most of the premium collection clerical work originating in the agencies was handled by the agencies themselves; the agencies were compensated for this work. With the order of the first IBM 705 in 1957, a decision was made to handle premium payments at the home office, thus reducing administrative demands on the agency offices. At present the home office processes all the flow of data to and from its general agencies and handles queries originated by policyholders and beneficiaries.

Conversion is not a Small Task

We learned that the conversion to electronic data processing increased from 7,000 policies per week as of April 1960 to 18,000 policies per week by January 1962. As of September 1962, all 1,700,000 policies were converted to EDP.

To accomplish this conversion all routine aspects of premium billing and accounting, dividends, commissions, reserves, policy loans, premium loans, surrender values, and so forth, had to be converted to EDP. The process actually began with the transfer of information such as premium payments, name and address changes, loan requests, etc., to punch card. From cards the information was transferred to magnetic tape, which was fed into the central processing unit for calculations and decisions as directed by the internally stored program. Other equipment, including printer and card punch, transformed the information from magnetic tape to paper forms or to punch cards. This "output" may be a premium notice, a check, a statement, or one of many other forms or reports.

The amount of work that went into converting this information from the manual or mechanical to the electronic method of processing data was extensive. The following statistics may reveal the magnitude of this conversion process.

1,700,000 policies converted
7,500,000 home office records used to provide policy information
5,500,000 punch-cards prepared and checked, just to place information on magnetic tape
47 bushels of confetti came from the holes punched out of the 5.5 million cards
136 man-years needed to prepare and check conversion data
50 man-years needed to prepare the original set of computer programs
2,040 hours of computer time needed to prepare new tape records
20,000,000 lines of printing on ititial policy status cards going to general agencies
187,000 miles of travel for home office people to help general agencies
32 reels of magnetic tape to store one set of master records, each reel holding 2400 feet of tape

380,000,000 characters of information (alphabetical letters and numerical digits) included in master records on magnetic tape

Conversion Pays Off

And what do all these statistics mean? What does this imply for present day operations? The story further unfolds as we continue with a brief summary of a typical cycle of work accomplished by the computers.

Information about each of the company's policies is stored on magnetic tape similar to the tape used for tape recorders.

Each day, premium payments, requests for loans, requests for policy status, and other types of transactions are punched into IBM cards. At the close of the working day, a second shift EDP crew starts processing these cards. The information on the cards is transferred to magnetic tape by IBM 1401 computers at the rate of 800 cards per minute.

When that tape is ready, it is processed on the IBM 7080 against another set of 32 tape reels containing the master file. To accomplish this, the IBM 7080 needs job instructions; these are referred to as programs and are also stored on tape and used by the tape as required.

During the IBM 7080 processing, the master file is changed to include any new information. The IBM 7080 also prepares a number of tape reels containing information for a variety of notices, statements, checks, receipts, status cards, and any other forms required. These are fed into the IBM 1401 system which has high speed printers to write the checks, premium notices, status cards, and other forms at the rate of 600 lines per minute. (An IBM 705 is also used, but for smaller jobs such as benefit payments, mortgage loans, etc. The IBM 7080 is program compatable with the IBM 705; that is, it can work on the same coded instructions programed for the IBM 705. The IBM 7080, however, has several advantages over the 705. It uses transistors rather than tubes and consequently uses less power, creates less heat, and is more reliable in performance than the 705. Its memory unit stores twice as much as the 705 and it processes work at speeds two to ten times faster than the 705.)

The morning after the night shift, the work is ready for whatever clerical processing remains before mailing to policyowners or agents or for distribution within the home office. On a normal morning the material ready for distribution from the processing of the night before would be as follows:

Statement for Loan or Surrender-------	367
*Premium Notices -------------------	8,975
*Late Payment Offer -----------------	867

* On a week-end these "outputs" would have a volume approximately 3 times as great.

*Statement of Balances	383
Policy Status Cards (to gen. agencies)	15,286
*Notice of APL	470
*Policy Loan Interest Billing	622
Loan Payment Receipts	347
*Dividend Checks	499

The Conversion would have been impossible without outside help

In deciding what equipment to order, and in the actual set-up, operation and maintenance of the machines, a local IBM sales office has played an important role at the insurance company. A brief history of the IBM personnel involved follows:

1955 - IBM sales representatives were consulted when the insurance company began its feasibility study of the computer installation.

1956 - IBM sales representatives make final presentation of their EDP equipment.

One IBM systems engineer begins working full time at the insurance company to help develop block diagrams and programs after the IBM 705 was ordered.

1957 - Two assistant systems engineers from IBM start working full time to help the systems engineer.

IBM customer engineers join the insurance company to maintain and service the computer.

1959 - One IBM customer service representative began servicing the insurance company's account. (This man is still working with the company and presently has two assistant systems engineers working with him.)

1960 - With the smooth operation of the machines, the three IBM systems engineers are released from the insurance company.

1961 - Finally, with the order of the IBM 7080, the three IBM systems engineers return to the insurance company to assist in programing changes required to transfer the insurance system to the new computer. (These men will again be released when all operations are working smoothly.)

At present one to six customer engineers service the equipment depending on schedule and circumstance.

* On a week-end these "outputs" would have a volume approximately 3 times as great.

1. STRUCTURAL CHANGE

Now that we have some idea of what work is done and how it is done, we will try to give some background into the department and divisions responsible for getting all this data accumulated and processed. The unit of primary concern is the Data Processing Department. However, the Conversion Division of the Treasurer's Department also assisted in the conversion process. Below is a brief history of change in the structure of these divisions.

Structural Change in Affected Divisions of Primary Concern

The Conversion Division

The Conversion Division, though not a part of the Data Processing Department, is included here because of its role in the conversion process; this division was set up in August 1960. Its functions were to select and compile from existing manual records all the types of information to be included in the computer system's master file. In obtaining the information, the Conversion Division worked with various units within the company. Data obtained from these units had to be coded, key punched, key verified, visually compared to source information, interpreted and errors corrected. For instance, Conversion Division worked with the Addressograph Division to get name and address data; with the Dividend Division to get plan of insurance, age at issue, etc; with the Policy Title Division to get ownership and assignment information; with the Policy Loan Division to get information on policy loan balances; and with the Treasurers Premium Collection Units to get information on accumulation and premium loan balances and premiums.

Data Processing Department

This is a service department that provides data processing service to other departments and produces reports for management analysis.

The establishment of a separate data processing unit on the departmental level was a major structural development. Electro-mechanical and electronic data processing functions were formerly handled in the units where the work originated. About midway in the conversion process these functions were centralized and were consequently handled by this department.

The nucleus of the Data Processing Department was formed in January 1957 and was formally recognized as a separate department in March 1961. Its unique service function was designed to provide a full range of data processing facilities for the other departments. The department is composed of four divisions: the Tabulating Service Division, the Controls Division, the EDP Center, and the EDP Systems and Programing Division.

It was the function of the Tabulating Service Division and the EDP Center to take the information from the Conversion Division in order to do the actual processing of the data. This processing usually took place during the second and third shift computer operations to have all information and forms ready for the next morning -- much as it does in the current operations.

Following are descriptions of the four divisions in the Data Processing Department:

(a) The Tabulating Service Division separated from the Actuarial Department and became a division of the Data Processing Department in March 1961. In this division punch cards are created on request and the agency status card file is maintained. The Tabulating Division is also used in those cases where it would be too expensive to make a computer program for a one-time small volume run. Presently, as during the actual conversion process, this division transforms all data into punch card form for use by other departments.

(b) The EDP Center (a new division) operates and handles computer runs, printing output, etc.; operates IBM 705, 7080, 1401's; is responsible for maintaining supply of tape and also tape library; operates a Burster and De-Collator; and may use key punch to replace damaged cards. This division was staffed by seven transfers from the Actuarial Department, Secretarial Division, two transfers from the Comptrollers Department, Methods and Procedures Division; one transfer from the Treasurer's Division, Premium Collection Division #3; and five new hires. Two of the new hires were tape librarians, one was a high speed printer operator, and two were college graduates trained by the company to be programers.

(c) EDP Systems and Programing (another new division) has as its primary function the developing of and putting into machine language (programs) the operations required to operate the computer. This division has changed little during the initial conversion. It provides thousands of instructions which must be developed and maintained to make the large-scale computer effective. In addition, the division offers advice in the development of new concepts and passes on the feasibility of new ideas.

It was staffed with two programers who were transferred from the Actuarial Department, Secretarial Division; one programer from the Actuarial Department, Mathematical Division; seven programers from the Comptrollers Department, Methods and Procedures Division; one programer from the Treasurer's Department, Auxiliary Division; one programer from the Treasurer's Department, Premium Collection Division #4; and one programer from the Secretarial Department, Death Claims and Endowment Division.

(d) Controls Division (a new division) receives input, distributes output, controls various accounts in company balances, prepares technical manuals for computer operations for various departments, and also does some systems input and output work. It is responsible for maintaining forms in inventory on a company basis and maintains about two months' lead on forms' usage.

This division has two sections. The "controls" section checks all the information processed by the computer. After all data is on punch cards, it is assembled and scheduled for computer processing by this division. It also makes a quick review of all the material the computer has produced (the "output") to make sure it is of satisfactory quality for distribution to policyowners, agents, and home office. This section does much work with figures, checking balances and reconciling various totals computed by the machines. If there are any problem cases, the section hunts them down and corrects the discrepancies. Out of 30,000 policies processed during one night, between five and ten may require investigation.

The "documentation" section of the Controls Division began its job prior to the conversion of the first agency in 1959. Its job consisted of designing all input and output forms needed for the computer operations. At present it continues to update and improve the current systems, codes, input requirements, work flow and other changes that continually occur. It was initially staffed by three transfers from the Comptrollers Department, Methods and Procedures Division,* and three transfers from the Actuarial Department, Secretarial Division.

To get a more complete picture of the make-up of the Data Processing Department, refer to the two following tables in Appendix #3, "Establishment of Divisions in the Data Processing Department", and "Data Processing Department Staffing Table -- Clerical Employees".

Structural Changes and Department Functions in Other Affected Departments

Actuarial Department

This department is primarily responsible for the mathematics of life insurance. The results of its mathematical knowledge are used as a basis for underwriting operations. Here, studies are made of experience under various policies and insurance plans. From these studies the premium rates to be charged and the surplus to be returned as dividends are determined. In this department, too, policy loans are made to policyowners as are calculations for those policyowners who wish to change from one plan of insurance to another or to surrender a policy.

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* The remaining portion of this division was given department status at this time.

Structural change in the Actuarial Department was limited to the transfer of the Tabulating Service Division out of the department to the Data Processing Department.* During the process of conversion, data processing specialists were first assigned to individual departments. Thus sixteen positions were added to the Secretarial Division of the Actuarial Department during the conversion process. When the new Data Processing Department was established, the sixteen specialists in data processing occupations were transferred along with their functions to the new electronic data processing divisions -- Controls Division, EDP Center Division, and Systems and Programing Division.

Mortgage Loan Department

This department function is investment of funds in the mortgage loan field. Loans are made on many types of real estate -- homes, churches, hospitals, schools, offices, stores, warehouses, factories, farms, shopping centers, etc. Bookkeeping, taxes, fire insurance, loan closing and servicing work are other functions.

No structural change occurred in the Mortgage Loan Department. All divisions that existed prior to the conversion to data processing existed after the conversion to data processing. Some divisions were given new titles in keeping with new or added functions and concepts. Thus the Bookkeeping Division became the Accounting Division, City Loan and Real Estate Division became Commercial Mortgage and Real Estate Division, Closing Loans and Real Estate Division became Mortgage Closing Division, Farm Loans Division became Farm Mortgage Division, Residence Loans Division became Residence Mortgages Division, and the Miscellaneous Division became the Mortgage Services Division.

Secretarial Department

This department is "secretary" to policyowners and beneficiaries, providing many and various services. These include paying death benefits and installments and offering suggestions for the use of policy proceeds to meet the needs of the policyowners. In addition, the department helps to establish pension trusts, arranges benefit planning, and provides changes in accordance with policy provisions as requested by the policyowners.

Structural change in the Secretarial Department occurred in two of the eight divisions which existed prior to EDP. The initial change was the establishment of the Files and Controls Division, which handles incoming mail, card records, etc. It is responsible for preparation and maintenance of all files pertaining to death claims, matured endowments, and surrendered policies payable under option or one sum. The division also handles disability waivers. These functions were removed from the Death Claims and Endowment Division and the Settlement Option and Annuity Division. Five months later, both the Death Claims and Endowment Division and the Settlement Option and Annuity Division were eliminated. Their remaining functions were transferred to two new divisions -- Benefits Account Division, which does bookkeeping of benefit payment journals, requisitions, and checks; and the Benefit Approval Division, which processes and approves claims for benefits, and services modification of methods of settlements, death claims, and disability claims.

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* The Tabulating Service Division is a service division which creates punch cards on request. It maintains the agency status card file. It also uses IBM 419 or 407 printers; these are used on special jobs of small volume.

Treasurer's Department

Main functions of the Treasurer's Department are the collection and billing of premiums due, payment of agents' commissions, and the disbursement of dividends due policyowners. Almost two and a half million premiums are billed annually.

Structural change in the Treasurer's Department was extensive. The initial impact of conversion to electronic data processing occurred in the Auxiliary Division, an established Treasurer's Department division. The Auxiliary Division initially handled the conversion process and all premium collection functions for converted agencies. Once the conversion of the company's one hundred agencies was well under way, a separate Conversion Division, which converted policies to the new system, was established and this function was removed from the Auxiliary Division. A Transition Division was also established to handle the new EDP operations, removing this function from the Auxiliary Division. As the percentage of policies processed under the old method dwindled in one of the five Premium collection Divisions handling already established policies with no address change, individuals were transferred first to the Auxiliary Division when it handled the new EDP functions, and later to the Transition Division when it was established. After the size of a Premium Collection Division dwindled sufficiently, it was discontinued. Personnel remaining were transferred either to the Transition Division or the remaining Premium Collection Divisions.

When the number of policies converted reached a sufficient level to warrant a further breakout of functions, the Transition Division's functions were divided into three new divisions:

EDP Agency Reports and Miscellaneous Division --

This division audits and journalizes reports received from agency officers and also audits and controls new policies paid for. Here policy changes and conversions are completed and journalized. New records are put on tape for new issues, policy change, reinstatement and conversion.

EDP Correspondence Remittance and Commissions Division --

This division has two distinct functions.

1. Premium change and service, which effects changes in record, card and tape for premium frequencies, dividend option and removal or change of classified extras, etc. It also effects premium discounts and policy reinstatements.

2. Premium collection and commission disbursement, which processes premium payments and pays commission to agents.

EDP Premium Loan Accounting and Miscellaneous Division --

This division handles accounting procedures for premium loan, accumulated dividends, premium values and government allotment.

Five months after its establishment, EDP Correspondence Remittance Commissions Division was divided into Premium Change and Service Division and Premium Collection and Commission Disbursement Division. Six months later, at the completion of conversion of all existing policies, the latter division was divided into the Premium Collection Division and the Commission Disbursement Division.

As the number of premiums collected under the old method dwindled, so did the size of the Premium Collection Addressograph Division, which prepared plates for collection forms, printed forms, and sent out company correspondence -- advertising. It was eliminated when conversion was completed.

During the height of the conversion process, the title of Premium Collection Division #6, which makes all address changes for insured and premium payers and prepares new card records for new policies, was changed to "Record Preparation" Division. This did not constitute a structural change; it was an indication of a change of emphasis.

A new division, Insurance Service Account, was established about two-thirds of the way through the conversion process. Its function was to provide a new service: a preparation of a pre-authorized check plan which presents a pre-authorized check against the insured's checking account on a monthly basis. A second function -- a tax-sheltered annuity plan -- was added as the conversion process neared completion.

Another new division, Key-Punch Input, was established when conversion was completed. Its function is the preparation of punch card input from new policies. Its personnel consisted of all remaining key-punch operators from the Conversion Division, which was eliminated when conversion of existing policies was completed. Several miscellaneous machine-operating functions were also transferred to this unit.

Methods and Procedures Department

A major structural change occurred when the Methods and Procedures Division was upgraded to departmental status. At the time this occurred, some functions and personnel were removed to the Data Processing Department. The Methods and Procedures Department is responsible for internal systems and methods, office space utilization analysis and planning, forms control, statistical charting, and some budgeting functions. It assisted in planning and conversion to EDP and performed some of the programing. It implements internal and external information, education and relations -- art work, photography, employee suggestion processing, and travel planning. The company switchboard also is attached to this unit for supervisory purposes.

It is significant to note that the Methods and Procedures Division was upgraded to department status, despite the fact that it lost important data processing functions at the same time.

DEPARTMENT FUNCTIONS OF UNAFFECTED DEPARTMENTS*

Agency Department

This is the Sales Department of the company. One of its primary jobs is to assist general agents in recruiting and training an adequate and quality sales organization. It also supplies agents with sales aids, administers national advertising and sales promotion programs, and conducts educational programs. Agents' contracts are checked and filed in this department. Also checked is each new application for insurance in order to determine which agents and agency receive credit. Sales figures for each agent and agency, for each month and for the year, are correlated by the Contract and Statistical Division.

Comptroller's Department

The over-all responsibility of the Comptroller's Department is that of assembling and maintaining all company accounts, including the preparation and certification

Note: The above transfers refer only to company personnel considered clerical; additional transfers of personnel considered managerial and professional occurred (e.g. Systems Analysts, Manager of Data Processing, etc.)

* Unaffected Departments are defined as departments in which no extensive changes in methods, systems and procedures have occurred prior to 12/31/62 as a result of conversion to EDP.

of the annual statement. In addition, they prepare payrolls and see that each employee works in the best possible surroundings with the best possible equipment. Included are the responsibilities for supplies, furniture and fixtures, shipping, mail, photo, phone service, office machine repair, art, and studies of more effective methods and procedures in performing various jobs.

Law Department

The Law Department is the legal advisor of the company. Its activities center around all legal aspects of the company's operations and project into every department. The insurance contract, investments, taxation, legislation, and compliance with insurance laws -- almost all of which vary from state to state -- are some of its important functions.

Medical Department

Chief function of the Medical Department is determining the medical and physical standards to be met by prospective policyowners. The appointment of examining physicians in the field is another area of responsibility.

Securities Department

One of the investment departments, the Securities Department, is responsible for investigating and recommending all bonds and stocks purchased by the company -- government, municipal, transportation, industrial and public utility investments. Once acquired, the investments receive periodic study and review by members of the department.

Underwriting Department

Approval of all insurance applications is the function of this department. It is the initial home office contact for new applications.

Personnel Department

The Personnel Department is responsible for the hiring and training of home office personnel.

President's Department

This is the Administrative Department of the company.

2. CHANGES IN HOME OFFICE EMPLOYMENT

Total home office employment in the company studied increased from a low of 1630 in January of 1957 (generally considered the initial stage at which EDP had an effect on the company) to a high of 1816 in March of 1962, at the height of the conversion process. Since then employment has gradually declined toward the January 1957 figure.

The increase in employment parallels the increase in work load created by the conversion process. Conversion of existing company records, operating of dual systems and procedures, and redundancies created the temporary increase in work load during the long conversion process.

Once the conversion process neared completion, a sharp reduction occurred among the number of new hires; this occurred both in "Affected" and "Unaffected" divisions. Company apprehension about a reduced need for workers -- once the conversion process was completed -- resulted in a policy of very limited hiring in both Affected and Unaffected areas. This was an attempt to leave vacancies into which displaced workers could be transferred. Therefore, at the end of 1962, the year in which conversion was completed, new hires fell off sharply, but total female employment was up 90 positions, when compared with December 31, 1956.

Mortgage loan field personnel are personnel attached to mortgage loan field offices and are not included in the home office employment used in this report. Thus far, computerization has not directly affected this area.

In company divisions where conversion to Electronic Data Processing resulted in a changed work method or changed procedures and systems (Affected Divisions), staffing was reduced from 603 at the end of 1956 to 597 at the end of 1962, or a drop of 0.9%. Additional reductions in the number of positions in Affected Divisions were expected over an extended period of time.

In divisions where no major change in procedures and systems or methods occurred (Unaffected Divisions), the number of positions increased from 804 at the end of 1956 to 811 at the end of 1962, an increase of 0.8%.

Several new divisions were created as a direct result of conversion to Electronic Data Processing (New Affected Divisions). These divisions were staffed with 94 new positions at the end of 1962.

Note: For monthly changes in total home office employment (including restaurant and maintenance employees) since 1957, see Appendix #2.

3. CHANGES IN TURNOVER

Employment turnover averaged 38 clerical positions a month during 1960 -- the highest during the conversion period. Hiring of clerical workers averaged 40.6 positions during 1960, also a high for the conversion period. An analysis of company separations and hires (see table below) during the last 12 years indicates some increase in turnover during the conversion period. The exact reason for the increase is not known. Union officials felt that pressure created by the conversion process created 25 to 30 percent of the turnover during the height of the conversion process. The company's Coordinator of Data Processing felt "it may have caused a few people to quit, but nothing like that." No adequate method of determining the exact cause of the turnover exists. It appears safe to state that some employees quit because of job changes or extra work load during the conversion period. To the extent that this occurred, length of employment was shortened.

Year	Average Monthly Accessions	Average Monthly Separations
1951	25.3	26.3
1952	27.0	26.1
1953	24.6	26.9
1954	26.3	21.1
1955	19.9	32.4
1956	47.3	42.6
1957	35.3 (1)	34.4 (1)
1958	22.6 (1)	25.0 (1)
1959	31.2 (1)	30.3 (1)
1960	40.6 (1)	38.0 (1)
1961	35.0 (1)	33.1 (1)
1962	23.4	34.2
1963	26.8	30.2

Some employees hired as temporary workers, either on a full- or part-time basis, were laid off by the firm. The employment of these workers appears generally to have been created by the conversion process which had a temporary peak during conversion of existing records.

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(1) Based on home office clerical employment only. (Over 90% of turnover occurs here). Turnover in other years is based on all home office employment. Thus turnover is slightly understated in these years.

Project staff wished to determine some causes of employment turnover at the life insurance company under study. Thus, during the first week of April 1963, a file check was made of all Milwaukee Employment Service office active and inactive clerical application cards. Each card was reviewed in order to discover if the applicant had ever worked for the subject employer. Further, a breakout of dates was made to find out if the reasons for separation had changed with the introduction of the computer. Since the first major installation occurred in 1957, this date was chosen to study the "before and after" effects of automation. The table below has a compilation of this file check.

Reasons for Separation or Desire to Leave Subject Company	Active File		Inactive File			
	Employed after 1/1/57	Employed before 1/1/57	Employed after 1/1/57	Employed before 1/1/57	Total	% of Total
Marriage	1	6	6	12	25	16.0
Illness/Accident	3	1	13	3	20	12.0
Moved to Another area			15	1	16	10.0
For better position	1		9	6	16	10.0
Pregnant	2		9	3	14	9.0
Higher wages	2	1	7	4	14	9.0
Did not like work			10	1	11	7.0
For school			8	1	9	6.0
Reason not given	1	1	4	3	9	6.0
Temporary job only			2	2	4	2.5
Work taken over by machine	1		2		3	2.0
No chance for advancement			2	1	3	2.0
Marital reasons		1	1		2	1.0
Not qualified for job			1	1	2	1.0
(S.E.) expects layoff			2		2	1.0
(S.E.) wants better job			2		2	1.0
(S.E.) no reason given			2		2	1.0
Disagreement with supervisor			1		1	0.5
Transportation problem		1			1	0.5
(S.E.) job taken over by computer			1		1	0.5
(S.E.) job to be discontinued			1		1	0.5
(S.E.) wants better pay			1		1	0.5
TOTALS	11	11	99	38	159	100.0

The one-time file check revealed:

1. In the month of March 1963, eleven applicants who had worked at the insurance company during some period since 1957 were seeking employment through the local office.
2. Since March 1962, ninety-nine additional applicants who at some time since 1957 had worked for the insurance company sought employment through the local office.
3. Of those applicants who had worked for the insurance company prior to 1957, eleven registered for employment through the local office during the month of March 1963 and thirty-eight had registered for work with our local office within the previous year.

NOTE: An application for work is kept active for possible job referral by the applicant's visit to the Employment Service office at least once a month. If a month lapses without contact from the applicant, his card goes into the inactive file for one year - after which time it is destroyed.
(S.E.) - Still employed (during time of file search) at insurance company.

4. DEGREE OF MECHANIZATION AND EFFICIENCY PRIOR TO CHANGE

The establishment had been using punched card tabulating equipment for many years before converting to computer. This had the effect, "pre-computer", of reducing the proportion of work done manually and on single keyboard-type machines. The emphasis had been on using alpha-numerical tabulating machines for high-volume production runs, particularly in areas where the fixed information captured on punch cards could be re-used with new data to update records at the next operating cycle. An IBM Electronic Calculating Punch was installed for the Tabulating Department in 1955.

In areas of numerical computing work not processed by tabulating machines, the degree of mechanization also was high; bookkeeping, calculating, and adding machines were used in preference to strictly manual methods.

In areas of non-numerical work, there also was a high level of machine use. Examples are:

Addressograph equipment for mailing (no longer in use)
Pneumatic tube in-office records distribution (still in use)
Microfilming for file storage (still in use)
Automatic typewriter use for retyping of constant data (still in use)
Inserting, sealing, and stamping machines for mailing (still in use)

5. CHANGE IN EQUIPMENT AND TECHNIQUES, POTENTIAL CHANGES

A. Change in Equipment and Techniques

1954 1955 An Electronics Committee at "management level" was appointed. Its represented the major company units that computer conversion would affect. The committee in turn appointed a subcommittee to conduct feasibility studies.

Feasibility studies began. They involved not only the selection of computers (the method), but also a detailed study of present and possible future systems and procedures in all work areas to be converted. Functional inter-relationships of the work units had to be analyzed in order to standardize systems and procedures in closely related departments and to suggest eventual "process-oriented" reorganization of corporate structure and sub-structures.

1955 1956 Two major studies were completed by the feasibility group.

One study recommended gradual centralization at the home office of policy-oriented data being processed on a fee-compensated basis by the approximately one hundred general agencies across the country. Only the high speed and storage capacity of the computers then becoming available would allow this vast mass of data to be processed at the home office.

The other major study demonstrated the feasibility of processing all policies on a daily time cycle basis, again because of the larger capacity and higher speed of the newer computers. This had drastic implications for operations and employment. These will be discussed later.

Representatives of computer manufacturers continued to work with the company on conversion planning and problems. Also, a team of management consultants was hired by the company to assist the feasibility groups, particularly in the area of equipment cost-to-value analysis. A recommendation to order an IBM 705 system was the result.

By December 1956, presentations of various computer manufacturers and the recommendations of the feasibility group had been heard by the Electronics Committee. An IBM 705 was ordered.

As an interim measure, an IBM 650 was obtained for use until the 705 went on line. This was a small-scale system. We did not study its impact, because apparently its main function was to assume home office processing runs formerly handled by tabulating machines. Its impact on personnel was limited.

1957 1958 IBM 705 large-scale computer and peripheral equipment were installed after environmental housing was completed (air conditioning and dust filtration, power and fire protection systems).

Systems analysis and programing efforts were intensified for the 705. EDP-oriented conversion of home office records, formerly processed by other than punch-card methods, began. Records conversion to central EDP of a representative general agency began and was almost completed. The records of the agency selected presented most of the problems later found in all other agencies.

"Debugging" of IBM 705 routine began.

1959 1960 Conversion of first general agency was completed. ("Bugs" plus introduction of a new type of policy slowed the conversion process in the home office.) Conversion of Mortgage Loan records to EDP began. This project was completed by the end of 1960.

Conversion of Settlement Option and Annuity records was completed.

1960 New equipment was ordered because the trend to handle more types of data by EDP than originally planned was extending. Original concepts of the computer as a bigger, faster calculating machine changed as the actual computer potential became apparent.

A very large-scale system, the "second generation" (transistorized) computer -- an IBM 7080 -- was ordered, and another 705 was leased for use until the 7080 arrived in January, 1962.

1962 To take full advantage of the faster speed of the 7080 system, 705 computer programs were reworked extensively. Despite the fact the computers were "compatible", existing programs could have been used without alterations.

Two IBM 1401 systems were installed. Their primary application was, and is, as input-output equipment for the large-scale computer. Their secondary application is for "minor" operations, such as payroll check production runs, for which they can be operated separately. A high-speed printer, when integrated into the 7080 system, permits a much greater use of computer capacity by the direct printing of internal and external reports, and particularly by taking over an increasing amount of "mail-out" printing, such as premium due notices. The 1401 systems were delivered in March and September of 1961.

A Farrington optical scanner was installed in late 1961. It is used to "read" data previously printed on the 1401; its biggest external data application is the sensing and recording of policy notices when these are returned to the home office. The scanner is used "off line", with its punched-card output converted to magnetic tape, which is used to update records during the daily-cycle computer run for policy updating.

Programing for the initial limited conversion of the Actuarial Department to EDP began with change-over scheduled for 1963.

B. Potential Changes

Major changes in the immediate future appear to be in the direction of further refinement of current applications and the continued "take-over" by computer of other home office clerical work. To the best of our knowledge, all current systems study is based on the "hardware" currently in use, except as follows:

In August 1962, a company study was begun on the desirability of acquiring magnetic ink character recognition (MICR) equipment, apparently for "reading" of checks. To date the results of this study have not been made public and are not known by project staff.

6. AREA OF UTILIZATION OF NEW EQUIPMENT AND TECHNIQUES

"...the conversion puts into electronic data processing almost all routine aspects of premium billing and accounting, dividends, commissions, reserves, policy loans, premium loans and other activities."*

"For each policy converted...at least four records formerly recorded manually on cards have been replaced."*

Magnetic tape records of all 1,700,000 policies now in force are run through the computer nightly in less than four hours, on the second and third shift. The computer-printer produces an average of 30,000 external and internal forms (for example: premium notices and dividend checks) during each nightly run. This daily time cycle gives systems analysts virtually unlimited scope for conversion planning; if a longer time cycle (for example: weekly policy run) had been selected, much clerical work, such as premium payment recording, that must be done daily could never have been put "on the computer".

Information Given by Computer

What kind of policy?
Who is insured?
What is his address?
Who is the agent? General agent?
Are premiums paid to date?
When is the next premium due? Amount?
What is the dividend option?
What is the present loan or cash value?

The EDP System

- Writes premium notices
- Writes checks for:
    - Claims
    - Surrender values
    - Maturities, Loans
    - "Full paid" dividends

* From a local newspaper article about the subject company, September 1962.

Figures all policy values
Figures and credits dividends
Keeps premium payment and commission records
Provides accounting totals
Checks the accuracy of its own work

And all of this is done every night of every working day for each of 1,700,000 policies.

Elaborate precautions are taken against accidental erasure of tape memories in the following manner. The policy-run tapes for the previous two days are retained by Data Processing to simplify rebuilding of records if anything happens to the current tape. Also, the tapes for the third day (the "great-grandfather tape") is stored in a secure vault in another section of the home office. The policy-run tape that is five days old at the end of a month (the so-called "great-great-grandfather tape") is sent to an underground vault outside the metropolitan area along with microfilms of the day's punch card production. Each month this procedure is repeated and the previous month's records are returned to the home office.

New types of life policies and a broader range of policy options are now being offered. Also, a newly created policy and annuity service unit made a wide variety of premium payment plans available to all policy holders in October 1962. One of these plans permits single payments for a group of individual policies. "Without electronic computers to handle this work, it would have been impossible..."*

We are unable to estimate the "percentage of total" of clerical work that EDP has assumed. All we can say is that in divisions already converted to EDP the majority of frequently appearing clerical work that is either routine or repetitive is already "on the computer". The "total" is almost impossible to determine because it has to include all types of clerical work for which there is unexpected or infrequent demand. This includes special "one-shot" reports for which computer programing would be too expensive. It also includes unusual insurance policy problems that would be programable but would unduly "load up" the computer with data and thus slow down the policy processing runs.

Now that the areas originally selected by the company for EDP have been converted, there is no slowdown in efforts by specialists in systems and programing. Current operating programs are being refined constantly, and new areas for computer applications are being studied. The major new project for 1963 is an integrated program that will not only convert three data areas to EDP but also merge the data for consolidated processing with separate report printouts apparently to be available as a result of "by-product" programing. The three areas to be affected are Policy Issue, Agency Statistics and Records Preparation.

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* From the company house organ, Septamber 1962.

The trend is continuing toward greater use of EDP as a "management information system" to produce reports for operations analysis. These computer-produced reports, whether generated as by-products of record updating runs or set up on a special basis, now can be more frequent, more up to date, more accurate, and more detailed.

We expect that a long-range systems analysis group recently set up will intensify the trend toward integrated data processing on a total-systems concept. Responsible to top management and not limited to study of specific and immediate problems, this unit should give the company a broader perspective on the dual problems of day-to-day operations improvement and management information. If successful in their work, the inevitable result will be a further standardization and streamlining of data processing on an inter-departmental basis.

The first steps in use of the computer for "operations research" have been taken. A one-shot special study was run, using "borrowed" personnel from a large local manufacturer. Whether efforts in this direction will continue or increase would seem to depend more on the availability of personnel with ability to handle the highly sophisticated concepts involved than on the determination of company needs. The need is there, particularly in the area of forecasting as in actuarial and market research.

7. CHANGES IN PRODUCT LINE OR SERVICE, POTENTIAL CHANGES

Diversification can be accomplished in two different ways. One is by expansion into entirely new fields of product or service; and the other, by diversifying the product or service "mix" within the original market area. This company chose the latter course.

Extension of company services was accomplished in three ways:

Offering a new type of non-medical life policy with diminishing coverage. (Consumer response to this policy is reported as excellent.)

Increasing the average number of policy options
Increasing the policy payment selection options

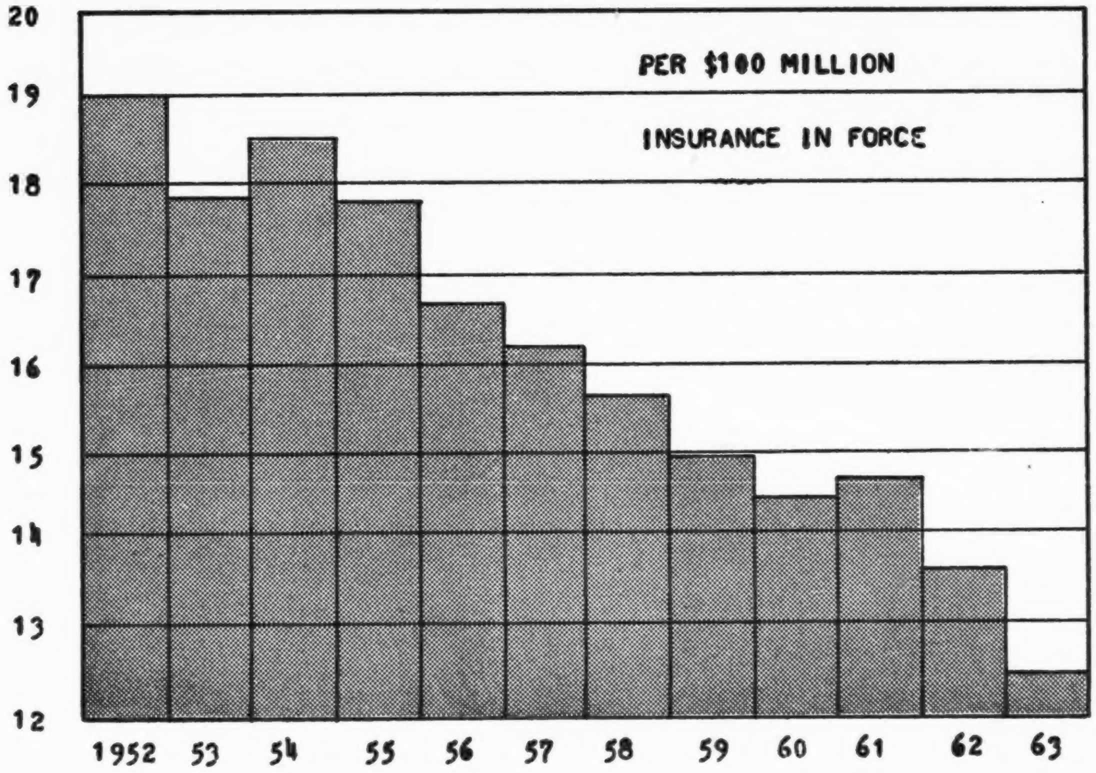
An insurance policy is an active instrument subject to change all the time it is in force. Thus the increases in policy types and options will have a continuing, rather than temporary, impact on the volume and complexity of data to be processed.

"Potential changes" appear to be along the line of "more of the same." So far as we know, the company has no plans to study any expansion outside of the life insurance field.

8. CHANGES IN WORK LOAD, PRODUCTIVITY

Labor productivity of the home office clerical work force has increased. It is increased even faster than the 1956-1962 figures shown in the pictogram below might suggest. In 1963 the final shakeout of EDP converted divisions occurred: a general tightening-up of operations, the elimination of parallel operations (new way plus old way), and a gradual reduction in checking of computer output as the new systems proved to be reliable.

HOME OFFICE MANAGEMENT AND CLERICAL EMPLOYEES*



* Taken from company annual reports of subject company.

During the 1956-1963 period, insurance in force rose from 8.4 billion to almost 12 billion -- an increase of 42.8%. Insurance written increased from 696 million in 1956 to 1,033 million in 1963 -- an increase of 48.4%. In 1963 when it passed the billion dollar mark the record-breaking year doubled the annual sales level of ten years ago.

Work load and productivity is particularly hard to assess in this insurance company:

First, because of the increasing data base created by the variety of new policy and option types. This includes automatic monthly premium withdrawal plans, where cooperating banks throughout the country deduct premiums due from depositors' accounts and credit the insurance company account.*

Second, because of the home office assuming work formerly done by the general agencies, which transferred 150 man-years premium work from the agencies to the treasurer's department at the home office.

Third, because of the fluctuation in number of new policies sold. These require more processing than policies already outstanding.

Fourth, because the average face amount and consequently the relative complexity of policies is increasing.

It is sufficient to say that a much greater work load is handled by almost no increase in work force. If work load formerly done by 150 clerical employees of independent agencies is considered, much more work is being done by fewer employees.

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* Not only is this convenient for the insured, but it makes the money available to the company several days earlier than under any other plan. For thousands of accounts over any time period, the cash advantage is substantial and adds to profitability.

9. AMOUNT AND TYPE OF PLANNING FOR THE CHANGES THAT AFFECT EMPLOYEES

The company adopted an "open book" policy for advance notification of employees before changes were effected. A formal policy was stated: that there would be no layoffs of permanent employees and no downgrading in pay or company classifications. The following methods of employee notification were used:

- House organ -- for advance notice and detailed progress reports on order and delivery of equipment and details of conversion
- Letters to home addresses of employers
- Bulletin boards
- Publicity in local newspapers
- Tours of EDP area in the home office
- Personal contact: unit meetings, annual full staff meetings, and other means, including individual information interviews if requested by an employee. Computer orientation lectures were held.

A Personnel Coordinator for Electronics Conversion was appointed. His job, the central-point handling of interdepartmental employee reassignments, was made necessary because of staffing changes resulting from computer use. His work reduced the chance of reassignment to and retraining for jobs that will be eliminated at a later date. Aptitude tests for EDP occupations were offered to all current employees who requested such tests. This helped allay employee fear of change.

Since 1958 a continued policy of employee notification has been in effect. The purpose was to explain the nature of equipment installed or on order and to explain present and planned application areas and the effect of this equipment.

This was a pioneering effort in handling internal relations problems created by EDP conversion. It is representative of common practice today* although many firms have not yet made a single person responsible for handling difficult EDP-caused personnel reassignment as this company has done.

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* See "Administration of Electronic Data Processing", National Industrial Conference Board, 1961, pages 105-119.

10. TRAINING AND RETRAINING

Training and retraining did not start with the planning for EDP. It has always been considered an essential part of company operations. This tradition contributed to the smoothness of EDP conversion; however, it turned out that there were no major unsolvable personnel problems.

Some examples of "in-house" training/retraining course titles for clerical and supervisory employees are:

Job Instruction (how to instruct)

Job Relations (human relations for supervisors)

Work Simplification

Effective Correspondence

Typing Review

Shorthand Review

Secretarial Training (for stenographers)

Reading Improvement

Management Development (conferences and seminars)

Some examples of outside training made available are:

" Life Office Management Association" (LOMA) courses

Night School courses in the local vocational school and colleges (cost-compensated if the course can enhance present or future job performance).

Almost all training/retraining of EDP-affected clerical workers was of the "understudy" or on-the-job type, after reassignments caused by the continuing high average attrition rate. The major exception was and is the released-time typing refresher course that improves present employability and makes future reassignment easier. Retraining had to be intensified during EDP conversion because of increased employee displacement. Staff assistance was made available for consultation with line supervisors when on-the-job training problems arose. The company has classrooms and an auditorium (with complete audio-visual facilities) on the premises for released-time training. Programed-learning (scrambled text) training manuals are now being used on an experimental basis.

The training director restated the company hiring attitude when he told us he felt very strongly that the function of schools should be to provide general courses. He feels a broad general education gives an employee an improved ability to adapt to changing job requirements. He regards the providing of "pin-pointed" courses as being the prerogative and responsibility of management, except when long-term technical training is required -- for example, nurses for the company clinic. The company regards typing and shorthand as "basics" for clerical workers, rather than as "pin-pointed" training.

11. TESTING

L.O.M.A. clerical (and in some cases, "Minnesota" clerical) aptitude tests are administered by the company personnel staff during the hiring selection process. The employer also has trained staff and equipment available to administer other specific proficiency tests (typing, etc.) on the premises.

Tests developed by the computer manufacturer have been used to aid in selecting employees for EDP occupations. The results of these tests are coupled with an analysis of the individual's training and company work experience to determine whether or not he will be assigned to EDP work. In the early stages of EDP conversion, internal public relations undoubtedly was a factor in the use of aptitude tests. Any employee who requested programing-aptitude testing was allowed to take this test. Three hundred employees applied and twenty were selected for a programer-training course.

Project staff suggested that Employment Service counseling and testing services might be helpful in the transfer of EDP-displaced workers. The employer did not adopt this suggestion. One reason probably was the feeling that outsiders cannot "know people" adequately even if they are competent in other respects. One reassignment problem is that of avoiding potential personality conflicts between unit heads and clerical workers transferred into units new to them.

The employer has shown definite interest in the current Employment Service test development work to establish General Aptitude Test Battery (GATB) norms for EDP specialty jobs and has allowed us to test and rate, during working hours, systems analysts, programers, and console operators in the company.

The establishment of testing norms for computer occupations was undertaken with the cooperation of the Data Processing Management Association (formerly National Machine Accounts Association) which had previously assisted the Employment Service in establishing of test norms for Tabulating Machine Operators. Initial contact with the Association was established by the Automation Demonstration Project. The actual test developmental work was accomplished by the Occupational Analysis Service of the State Administrative Office. These tests are now available:

Systems Analyst	0-69.985	B-558
Programer	0-69.981	B-545
Console Operator	1-25.17	B-565

Employers have shown extreme interest in the development of the test batteries. It is the opinion of project staff that the battery of tests for data processing occupations is a valuable tool that will receive extensive use.

Interest shown in the publication, "Occupations in Electronic Data Processing", has been very extensive. Many employers were not aware of this publication. The interest was so great that mimeographed copies were distributed to local as well as out-of-state employers. This publication is currently being revised by the Milwaukee Occupational Analysis Field Center, with the assistance of an Automation Project staff member. It is felt that when revised this guide to occupations in the computer area will create even more interest among employers.

12. CHANGES IN WORKER STATUS AND CHARACTERISTICS

The average clerical salary in this company increased 21% in the six-year period between 1956 and 1962, which is generally considered the period of conversion. During this time the local labor market average salary scales also increased by approximately the same amount. The company now is hiring more college graduates than was the case several years ago, giving an additional upward bias to salary averages. Average salary for 1962 New Hires was 39% above that for 1956.

Transfers hit their peak during and after major work unit conversion to EDP.* In many cases the redundant work caused by the running of dual (new and old) operations until new programs were "de-bugged" has delayed reassignment of clerical workers. Further refinement of current systems, plus extension of EDP to new areas, will tend to keep the volume of employee transfers at a higher level than "pre-EDT". Many transfers were caused by systems analysis that indicated the need for functional reorganization

* "Permanent-status" employee transfer problems were reduced by the high attrition rate and the use of temporary and contract agency workers, particularly temporary key-punch operators and verifers who assisted in records conversion.

of work units rather than by the direct effect of the computer as a piece of "hardware". Some upgrading of duties after transfer did occur (particularly in the case of transfers to positions in newly-created EDP jobs, such as programer and console operator). Many transfers did not seem to involve upgrading -- they were to "pre-EDP" positions at the same level, or were to "post-EDP" positions at the same level where the new source of material processed (for example, computer-printed output) did not affect the complexity of the job tasks. In many cases we could not tell from our staffing patterns whether or not transfers resulted in upgrading or downgrading because of the structural deficiencies of the current D.O.T. (our measuring tool) and we did not have time for lengthy job observation. Some company unit heads regard new clerical positions involved in processing of data for computer input as being upgraded. It seems, though, that their concern is caused by the need for added clerical accuracy. (Data is converted early to "machine language", less input checking is possible, and errors can be more costly.) Details of transfers and of some changes in promotional lines are included in Section 14.

Promotional possibilities are affected by things other than the change to EDP. For instance, hiring of male high school graduates for entry clerical work has almost stopped because of salary considerations, and according to a company official, this is also the case in the home offices of other large life insurance companies. The reason for this drop in hiring is not "the computer" but that these companies are no longer competing for boys entering the labor market from high school. Large manufacturing companies traditionally have had higher average pay scales, particularly for entry shop jobs for men. This opens promotional lines for female clerical workers in insurance companies.

Because lower-level, routine positions (usually entry) now are being reduced by EDP, average company tenure and individual job and company background knowledge of women is increasing. This in turn will tend to raise the average level of salary and company classification. The present trend in EDP-affected clerical positions is toward a job task "mix" with more "decision making" and less routine work (routing, etc.) even when job tasks are the same. When more lower-level "decision making" is programed for computer, the trend should accelerate. The remaining clerical functions will be at increasingly higher levels of complexity, with a lower proportion of clerical time allocated to routine tasks.

13. HIRING CHANGES

Changes in hiring have occurred. The impact of Electronic Data Processing on the current work force is much smaller than it will be on the future work force. The company Coordinator of Data Processing at the firm has expressed an opinion that total employment of the home office will go below the level it was "before automation". Also with expansion of EDP, plus the long-run refinement of procedures, systems and methods, employment may drop substantially This is despite the facts that:

1. The home office is assuming work formerly done in the general agencies.
2. The dollar volume of insurance in force is increasing rapidly, with corresponding increase of work load in such areas as premium billing and collections, policy loans, mortgage loans, and so forth.
3. The dollar value per policy is increasing, thus increasing the average complexity of policy issue labor and of processing. The number of policy options increases roughly in proportion to the policy dollar value.

The rate of hiring has fluctuated with the conversion process. See Table, page 29. The rate of hiring jumped to a monthly average of 47.3 persons during 1956, which is the year prior to installation of the first computer. Hiring dipped to a low of 22.6 persons a month during 1958 and rose again during 1959-1961. Since 1961, the rate of hiring has been reduced. If company projections are followed, hiring will be reduced further. The company formerly "stockpiled" clerical help by overhiring high school graduates as they entered the labor market at the end of each semester.*

The reason for stockpiling is that most labor market entrants are available to the industry only after June graduation from high school. Relatively few persons graduate from local and state schools in February. The extremely limited number of high school graduates with adequate typing ability, plus the high attrition rate of new hires, resulted in a policy of hiring more entry workers than were needed during the period in which they were available. Stockpiling also occurred for non-typing jobs, but is no longer done since the computer has reduced the need for entrants without typing ability.

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* This "stockpiling" now has been reduced. There was limited overhiring of June 1963, high school graduates.

The traditional source of clerical employees has been the recent female high school graduate. This is still the major source of applicants; however, changes have occurred. The table below lists some pertinent figures.

Clerical Employees **	1956	1962	Change
College graduates (M & F)	64	110	71.8%
College drop-outs (M & F)	106	111	4.7%
High School graduates (M & F)	952	981	3.0%
High School drop-outs (M & F)	96	64	-33.3%
Total Employment	1218	1272	4.4%
High School graduates (female)	756	807	6.7%

In summary:

1. The number of clerical employees with college degrees has increased at a rate far greater than the rate of increase in total employment.

2. The number of clerical workers without high school education decreased, while total employment increased.

3. The number of clerical employees who are college drop-outs increased at a rate comparable to the rate of increase in total employment.

The firm lists most openings with the Wisconsin State Employment Service. Other hiring is a result of extensive recruitment at local and state-wide high schools and colleges. The firm also has a very large volume of "walk-in" applicants. Hiring requirements are high and rigid. A grade point average of "B" or better is required of all recent high school and college graduates.

Field recruitment at local and state high schools, of clerical entrants with typing or typing and shorthand ability, is continuing. But the need to recruit clerical workers without the above-mentioned abilities has been reduced or eliminated by installation of the computer.

Programer trainees were originally test-selected from other company divisions. This policy resulted in a drain of key personnel from the other divisions. The firm is now selecting all programer trainees from recent college graduates.

** Company definition

The type of applicant hired is changing. The employer usually does not now hire male clerical entrants for general clerical work, except that men are hired for specific functions such as office machine operators. This change in hiring practices is caused by the experience of not being able to keep young men, who generally migrate to higher paying industrial firms. The hiring practice change has been in effect for several years here as well as in many other insurance companies, and is not a situation that can be attributed to the change to EDP.

Professional Jobs: The outstanding change in work force characteristics is the increase in number of staff "specialists", while the number in middle line management ("supervisors") remains the same.

Clerical Jobs: Future hiring will be directed even more strongly toward the female high school graduates who possess typing and shorthand ability. Use of the computer has greatly reduced the need for clerks who cannot type, and makes their reassignment increasingly difficult. The need for messengers, file clerks and other "paper shufflers" performing tasks of a routine nature has been drastically reduced by the change to EDP as a method. The changes in systems and procedures ("streamlining", integration by multiple use of data) further reduce the routine clerical tasks. Positions where typing is just an incidental function to other clerical duties already have been reduced. Also, use of the computer for hard-copy (printed) output has lessened the need for clerks who can do only repetitive typing. Further refinement and extension of EDP to areas not yet computerized will result in an additional depletion in the number of positions for non-typing clerks.

All this may seem to contradict the above-mentioned need for typing (or typing plus shorthand) competence, but it does not. Increasing sales * result in an increased load in non-computerized work areas.

14. OCCUPATIONAL CHANGES

MANAGERIAL AND PROFESSIONAL O-X

"Persons having the qualifications necessary for entry into work requiring the capacity to acquire and apply special knowledges involved in...research...business relations, or management." (from the D.O.T.)

A continuing increase in demand for programers and systems analysts is expected, despite the fact that a large portion of company work is

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* See 8. Changes in Workload, Productivity, Page 37.

now on the computer. There are several reasons for this:

1. No major computer program is ever "complete". Details can always be refined to improve accuracy or flexibility, and to reduce computer processing time.

2. Computer programs need constant revision as program objectives are modified. These changes are often forced by external factors, such as intra-industry competition, that compel offer of new services or of new data breakout on current operating programs.

3. A normal promotional line from programer to systems analyst will continue to create vacancies at the programer level. The normal source of persons for programer positions now is from outside the subject company. University graduates are being recruited. This is a change in company policy. Early in the conversion period to electronic data processing, the usual company practice was to select currently employed personnel for training as programers.

4. Another promotional line has been established, from systems analyst to "mainstream" operations at the middle-management level, as "staff" rather than "line" personnel (in company terms, to "Specialist"). This will have several effects. The rate of hiring of programer trainees -- and promotion of experienced programers to systems analysts -- can hold steady or increase, instead of slowing. The EDP unit may never "fill up". Most important, the presence at the middle-management level of persons with experience in computer systems, methods, and procedures, will:

   a. simplify communication between management and the EDP unit.

   b. enhance management understanding of the use of the computer as a tool for management.

   c. make possible a better definition of the relationship of the EDP unit to the whole of company organization. Improved management direction and control of this unit will result.

5. The larger capacity of the new computer will allow future consolidation of programs when feasible, and will permit more management information to be generated and summarized, either on a special-report basis or as a by-product of normal operating runs. Such large, consolidated programs will require relatively more systems analysis where a functional process approach compels study on a cross-departmental/divisional basis.

6. New operating applications for the computer can be studied more easily now that the "initial conversion phase" is over. And as these applications are expanded, they will increase the data base from which by-product analysis-for management reports can be programed.

7. It can be assumed that "one-time" studies will increase in the future as more of the company operating systems are converted to computer processing and systems analysts become available for this work. Obvious study areas are in actuarial analysis and securities-and-investment analysis and forecasting, in cases where costs of results produced by non-computer methods are prohibitive. Steps in this area have been tentative up to the present time. One forecasting study was set up using high-level systems personnel of a local manufacturer. Any major expansion in this study area will require either the upgrading of the insurance company's own systems analysts to the mathematician/operations researcher level, or the recruiting of outside personnel, because of the highly sophisticated level of mathematics required in setting up these programs.

   The number of Office Managers 0-97.12 (entry code would be Managerial Work CAFS 0x8.1) dropped from 30 to 24 in the affected divisions during the period under study -- a decrease of 20%. A further decrease in such lower-level working supervisor positions may occur as individual span of control is reduced by systems, procedures and methods improvement, even where the responsibility level is unchanged.

COMPUTING WORK (CLERICAL LEVEL) 1-x1.1

> "Work involving accurate calculating by arithmetic, higher forms of mathematics, or statistics. Workers may be required to use calculating machines, slide rules, or complicated tables." (D.O.T.)

The jobs that were reduced to the greatest extent relative to the total staff by change-over to computer are of much the same type as those that were affected by introduction of punch-card tabulating machines (prior to the time of this study). They are jobs that:

1. are routine or repetitive (or both) and those that

2. involve checking for human error introduced during and after original capture of data.

   An example of (1) is: Payroll Clerk, 1-26.02 -- positions reduced from 3 to 0 during the survey period. Payroll data is run through a computer pay-check production program, and this run is used to update the master year-to-date payroll file.

   An example of (2) is: Auditing Clerk, 1-01.32 -- positions reduced from 27 to 11. This is despite additional emphasis put on accurate original recording (and checking) of data; the decline appears due both to the decrease in error susceptibility of the computer as compared to manual methods -- often by a factor of several hundred -- and to the internal checks and controls incorporated in computer programs.

The number of the other job positions in the manual and keyboard-type single machine areas (example: Statistical Clerk 1-36.01, Calculating Machine Operator 1-25.13, etc.) has not declined during the survey period. This may be due partly to use in parallel operations after recently-completed computer conversions; however, it appears that the primary current tasks are in (a) "one-time" special projects, (b) short-term project, and (c) infrequently run special projects. Note that jobs falling in (c) can be eliminated by computer conversion _if_ it is decided that cost-to-value factors indicate that such reports be programed for computer because of anticipated need for these reports in the future.

GENERAL RECORDING WORK 1-x2.0

> "Work involving a variety of clerical tasks, the most significant of which involves the keeping of records requiring accurate entering, transcribing, or checking of words or figures. Workers are frequently required to exercise a considerable amount of independent judgment." (D.O.T.)

The number of positions in some jobs in this area can be expected to decline, relative to the total of the employer's work force, as a greater proportion of information is captured in machine language for straight-line routing to computer, and as parallel (new plus old way) operations decline. Perhaps the greatest number of vulnerable positions in the entire work structure are in the Checker II, 1-03.02, area where employment was increased from 58 to 70 during the study period. Some of these workers (at last analysis) were still checking virtually error-proof computer output, others were "checking the checkers" on input preparations, and the rest were employed in parallel (new vs. old way) operations checking. Bookkeeping-Machine Operators I and II, 1-02.01 and 1-02.02, (combined total of positions reduced from 20 to 14 during study period) occupy an even more vulnerable position at present and may be further reduced in the near future.

Problems were being encountered by the subject company in reassignment of persons in the Clerk, General, 1-04.01 category, according to the employer's personnel coordinator for electronics conversion. These persons have no typing ability and are doubly difficult to reassign when lacking other machine operating experience. This would indicate increased stress on typing ability in future hiring. The number of persons with the 1-04.01 D.O.T. Code decreased from eight to six during the study period. More of these jobs were to be eliminated soon by EDP.

TYPING 1-x2.2

> "Work involving the recording of material by means of a typewriter." (D.O.T.)

Two D.O.T. occupational titles are merged for consideration here:

Clerk, General Office 1-05.01 (1x2.0) and
Clerk - Typist 1-37.34 (1x2.2) (1)

The total number of positions in these two jobs increased from 48 to 63 during the study period. This figure reinforced information gained in interviews that typing ability is still a "negotiable commodity" and enhances both transferability of present workers and hiring consider--tion for labor market entrants and re-entrants.

The significant change in this area is an apparent trend from "typist only" to composite, broader-scope jobs.

Typists 1-37.32 (1-x2.2) positions declined from 36 to 15, while the combined total of Clerk, General Office 1-05.01 (1-x2.0) and Clerk-Typist 1-37.34 (1-x2.2) positions increased from 48 to 63 -- a decline of six positions in the grand total of the three jobs.

Combining the totals in these three above-mentioned jobs with those in the area of Stenographic Work 1-x2.3 (Stenographer 1-37.12 and Secretary 1-33.01) the number of employees with non-incidental typing ability still stands as a decline of six during the survey period (2), despite the fact that the average dollar value of policies in force has increased. This is a standard for assessing labor productivity because of the positive correlation of policy value increase and increase in policy options. These options raise clerical processing time.

The labor productivity increase in this area can be attributed to two basic reasons:

1. the use of hard-copy (printed form) computer output as a substitute for other methods of generating
   (a) routine external communication and
   (b) internal reports.

2. the continuation of formal analysis of systems, clerical methods and procedures in both
   (a) the computer area and
   (b) in non-compatible clerical operations, such as preparation of special records and reports.

(1) These job descriptions in the D.O.T., Vol. I are not mutually exclusive and lead to discrepancies when different analysts convert same or similar jobs to D.O.T. code structure.

(2) See preceding "General Recording Work" -- employer still emphasizes desirability of typing training and experience.

STENOGRAPHIC WORK 1-x2.3

> "Work involving taking, transcribing shorthand or speed writing notes by hand or machine." (D.O.T.)

Decline in Stenographer Positions	1-37.12	From	17	to 9
Increase in Secretary Positions	1-33.01	From	10	to 18
	Total		27	27

Much of this change was caused by the increase in number of staff specialists and the training of stenographers as secretaries to assist them on the new assignments. This is a definite indication of upgrading a part of the clerical work force to higher levels of complexity.

"Secretarial" jobs, as compared with "stenographic", has higher requirements for handling varied work, making independent judgments, and "dealing with people".

ROUTINE RECORDING WORK 1-x2.9

> "Work involves routine checking and recording. Workers may be required to enter transactions, post entries, make out bills and invoices, fill out forms, check lists, or engage in related unvaried activity." (D.O.T.)

Key-Punch and Verifier Operator jobs are grouped elsewhere because the alpha-numeric keyboard machines now in common use indicate a closer functional relationship to typing occupations.

Few of the company jobs can be classified as "unvaried", as in the definition, but all such jobs can be considered as subject to scrutiny for eventual further reduction in the number of positions or elimination of the job entirely.

Affected divisions showed a total decline of eight positions in the following jobs:

Billing Clerk II	1-18.82	(1 to 0)
Posting Clerk	1-01.43	(5 to 2)
Assembly Clerk	1-08.03	(5 to 1)

CLASSIFYING AND RELATED WORK 1-x4.0

> "Work involves a variety of clerical tasks, the most significant of which is gathering, classifying, or sorting letters, reports, and similar records. Workers may be required to exercise considerable judgment." (D.O.T.)

The number of Coding Clerks 1-36.05 positions may decrease, although extensive conversion is still continuing "after EDP". The number of persons in this classification increased from one to six during the conversion period studied.

Increase of File Clerks I, 1-17.01 positions from one to six and of File Clerks III, 1-17.03 positions from nine to eleven during the period does not indicate any significant trend toward upgrading of relative "skill" levels in affected-division file clerk jobs. This contrasts with our original expectation that increased "skill" levels forced by amount of time spent by file clerks on "exception processing" would increase the relative proportion of positions at the highest skill level of the class, i.e., "File Clerk III". However, the median "skill"-level (File Clerk II, 1-17.02) job (1) was virtually eliminated (13 to 1) in affected areas. When the employment figures in this group are merged with those in File Clerk I, the decrease in the two lower file clerk codes is from 14 to 7, or 50%, as compared to the File Clerk III increase from 9 to 11, or 22%.

ROUTINE CLERICAL WORK 1-x4.9

> "Work involves attention to details in the performance of routine tasks such as filing, sorting, or delivering clerical material." (D.O.T.)

The main point of significance here is the large decrease in File Clerks II (1-17.02 from 13 to 1, or 92%. This is discussed on the preceding page, under Classifying and Related Work (1-x4.0).

The number of persons classified as Clerks, General (1-04.01) decreased from 8 to 6, or 25%. Reference to the difficulty involved in transferring clerical workers without typing ability has already been made above, in discussing General Recording Work (1-x2.0) and Typing (1-x2.2).

No significance can be attached to the increase of Messengers (1-23.14) from 12 to 21, or 75%, because the figure is distorted by pre-1963 seasonal over-hiring of graduating high school senior girls for these entry clerical positions. Moreover, our detailed studies of affected divisions were done on a "before/after" basis, not by month-to-month and annual comparisons.

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(1) Classified in the D.O.T. as Routine Clerical Work 1-x4.9, not as Classifying and Related Work 1-x4.0

NON-INCIDENTAL TYPING DUTIES "BEFORE/AFTER" CONVERSION IN COMPUTER-AFFECTED DIVISIONS

	Positions Before		Positions After	
	36		15	Typists 1-37.32
	10		46	Clerk-Typist 1-37.34 (Not mutually)
	38		17	Clerk-Gen. Off. 1-05.01 (exclusive)
Sub-Total	84		78	
	2		0	Billing Mach. Op. I 1-25.02
	1		2	Transcribing Mach. Op. 1-37.36
	17		9	Embossing Mach. Op. II 1-25.43
	17		9	Stenographer 1-37.12
	10		18	Secretary 1-33.01
Sub-Total	131		116	
	13		25	Key Punch Oper. 1-25.62 (1)
	0		3	Verifier Oper. 1-25.66 (1)
TOTAL	144	vs	144	

(1) Number of Key-Punch-Area jobs should drop except in future periods of extensive new conversion. Use of an optical scanner on daily records updating had the direct effect of eliminating four Key-Punch Operator and four Verifier Operator positions.

15. EFFECT ON AGENCIES

A company official has estimated that a minimum of 150 positions have been eliminated across the country in the general agencies. This is a direct result of the take-over by home office EDP of policy-oriented data. Previously, the company had the general agencies do this work on a fee-compensated basis. This does not mean that there was a corresponding number of layoffs at the general agencies. Many of the clerks doing this work may have been eliminated by attrition or may have been transferred to other work, such as aides to sales staff, etc.

The elimination of 150 positions in the agencies is the most drastic immediate result of the conversion to Electronic Data Processing. The 150 positions eliminated is equal to 10% of 1962 home office Clerical, Professional, and Managerial employment. All positions eliminated apparently would be classified as Clerical under the company's classifications structure.

16. EFFECT ON OTHER FIRMS

This can be summed up in one word: COMPETITION. Vigorous expansion into new policy types and the offering of a large variety of policy options and payment options gives the salesmen of this company more "guns" in going after the available new policy business. The speed and accuracy of policy service operating runs, made possible by broad-spectrum EDP applications, puts even more pressure on companies that cannot meet these standards. Use of the computer as a tool for management analysis and control has an impact that cannot be assessed as easily, but it aids in "tightening up" general operations. Use of centralized EDP, coupled with automatic premium withdrawal plans (from checking accounts of policyholders), has values apart from sales promotion and clerical cost cutting. Premium payments can be "put to work" as much as several days sooner than was possible "pre-computer". (As explained on page 38, "Changes In Work Load, Productivity.")

17. EFFECT ON EMPLOYMENT SERVICE

Placements in non-typing clerical occupations(D.O.T. definition) should drop.

Competition (already extensive) for the available applicants with typing or typing and shorthand ability will become more intense. The supply that is available for referral through the local offices will dwindle unless it is replenished by asserted recruitment efforts.

Placement activity in new occupations created by EDP will not occur in quantity, despite a large potential, unless specialized knowledge of EDP is acquired by interviewers doing this placement.

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Some basic elementary understanding of computers is necessary to interpret this report. Yet project staff does not consider it the purpose nor scope of this report to serve as a primer to understanding elementary computer operations. The time and length of this report would become too extensive if we attempted to compose such a section on the computer. It is further felt that an abundant source of information on the subject is available.

The most easily understandable introduction to computers and how they operate is a book by the Science Research Association, listed below; the book contains sixty-three pages. We have selected this book along with several others as a bibliography which should serve as a general background in electronic data processing.

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APPENDIX #1

THE NEED FOR STRUCTURE AND DEFINITIONS

Section 1 . . . . STRUCTURE OF WORKER FUNCTIONS

Section 2 . . . . "PROCEDURES", "METHODS" AND "SYSTEMS"; OTHER DEFINITIONS

Section 3 . . . . LIMITATIONS OF CURRENT AUTOMATION RESEARCH

THE NEED FOR STRUCTURE AND DEFINITIONS

In analyzing the effect of conversion to electronic data processing at this insurance company, it became evident that without a structure no adequate measure of change could be made, and without precise use of definitions our reports were nebulous.

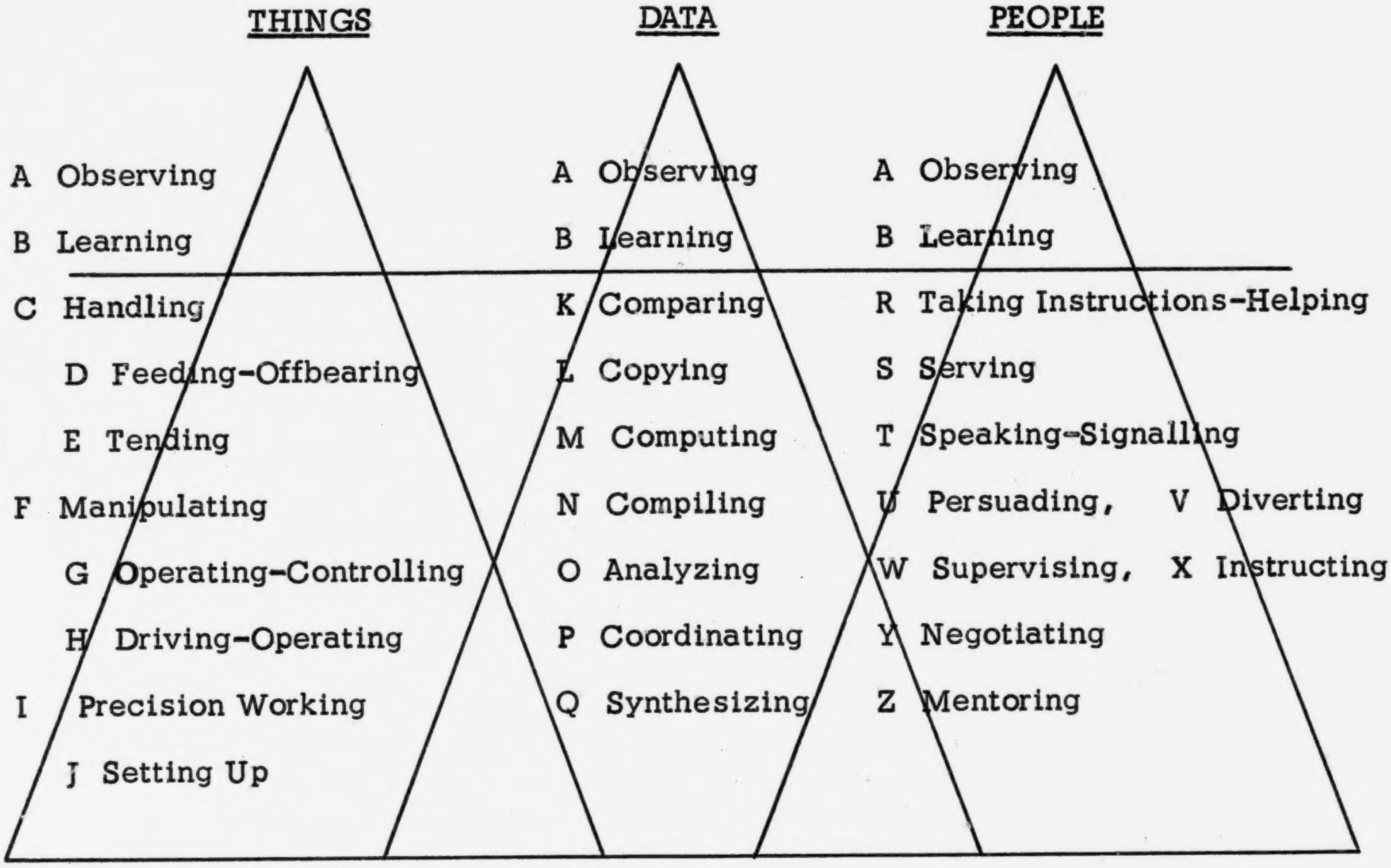
No structure for Professional, Clerical, and Managerial occupations exists in the second edition of the Dictionary of Occupational Titles. A structure of "Skilled", "Semi-Skilled", "Unskilled", which exists in the "blue-collar" area of employment (although never precisely defined), is commonly used in commentary on the "Impact of Automation". Obviously, extension in the use of the "Skilled", "Semi-Skilled", and "Unskilled" structure to "white-collar" jobs, which erroneously occurs or is implied in commentary on technological change, cannot occur in research. This structure simply does not exist in "white-collar" areas. The habit of using and extending an undefined structure to the "white-collar" areas obstructed our research and may be obstructing everyday Employment Service operations.

To make research fruitful and commentary meaningful, adequate measures and precise definitions must be used. Without definitions and a frame of reference, the mass of data on automation and technological change -- unwieldy by sheer size alone -- becomes unintelligible.

We have attempted to use words, such as "Job", "Position", "Occupation", etc., in the context of the Definitions included in Section 2 of this Appendix. This was difficult as we, too, are conditioned to using key words loosely and in changing contexts.

The THINGS-DATA-PEOPLE structure of worker functions, developed and refined in years of research by the Occupational Analysis Field Centers of the United States Employment Service, has a framework that permits comparison of all occupations. Levels of complexity replace the generalities and vagueness of "grade and skill". We have included "Structure of Worker Functions" in Section 1 of this Appendix.

STRUCTURE OF WORKER FUNCTION


THINGS
DATA
PEOPLE
A Observing
B Learning
C Handling
D Feeding-Offbearing
E Tending
F Manipulating
G Operating-Controlling
H Driving-Operating
I Precision Working
J Setting Up
A Observing
B Learning
K Comparing
L Copying
M Computing
N Compiling
O Analyzing
P Coordinating
Q Synthesizing
A Observing
B Learning
R Taking Instructions-Helping
S Serving
T Speaking-Signalling
U Persuading, V Diverting
W Supervising, X Instructing
Y Negotiating
Z Mentoring

Notes:
1. Each successive function reading down usually or typically includes all those that precede it.
2. Feeding-Offbearing and Tending, Operating-Controlling and Driving-Operating, and Setting Up are special cases involving machines and equipment of Handling, Manipulating, and Precision Working, respectively, and hence are indented under them.
3. The hyphenated factors Feeding-Offbearing, Operating-Controlling, Driving-Operating, Taking Instructions-Helping, and Speaking-Signalling are single functions.
4. The factors separated by a comma are separate functions on the same level separately defined. They are on the same level because although excluded from the one above it, usually one or the other and not both are included in the one below.

DEFINITIONS OF WORKER FUNCTIONS

Note: The terms "Machines," "Tools," "Equipment," and "Work Aids" are used as defined in the Manual. *

A. OBSERVING

Applying selective attention to the work environment, or a part of it, as perceived through any of the senses.

B. LEARNING

Observing and studying to acquire knowledge and skill. Applies to apprentices, helpers who are informal apprentices, and students.

Note: Observing and learning are a necessary base for all other functions; however, they are not to be assigned as ratings. Learners of various types (helpers, aids, apprentices, etc.) are to be assigned the functions of the job which they are learning. The title typically reflects the "learning" status of the job.

"THINGS" FUNCTIONS

C. HANDLING

Using body members, hand tools, and/or special devices to work, move, or carry objects or materials and involving little or no latitude for judgment with regard to attainment of standards or in selecting appropriate tool, object, or material.

D. FEEDING-OFFBEARING

Inserting, throwing, dumping, or placing materials in or removing them from machines or equipment which are automatic or tended or operated by other workers.

E. TENDING

Starting, stopping, and observing the functioning of machines and equipment. Tending involves adjusting material or controls of the machine, such as changing guides, adjusting timers and temperature gages, turning valves to allow flow of materials, and flipping switches in response to lights. Little judgment is involved in making these adjustments.

F. MANIPULATING

Using body members, tools, or special devices to work, move, guide, or place objects or materials, and involving some latitude for judgment with regard to precision attained and selecting appropriate tool, object, or material although this is readily manifest.

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* "Work Performed Manual", Division of Placement Methods, Bureau of Employment Security, 1959.

G. OPERATING-CONTROLLING

Starting, stopping, controlling and adjusting the progress of machines or equipment designed to fabricate things or data and/or process things, data, or people. Operating machines involves setting up the machine and adjustment of the machine or material as the work progresses. Controlling equipment involves observing gages, dials, etc., and turning valves and other devices to control such items as temperature, pressure, flow of liquids, speed of pumps, and reactions of materials. Set up involves several variables and adjustment is more frequent than in tending.

H. DRIVING-OPERATING

Starting, stopping, and controlling the actions of machines or equipment for which a course must be steered, or which must be guided, in order to fabricate things, process, and/or move things or people. Involves such activities as observing gages and dials; estimating distances and determining speed and direction of other objects; turning cranks and wheels; pushing clutches or brakes; and pushing or pulling gear lifts or levers. Includes such machines as cranes, conveyor systems, tractors, furnace charging machines, paving machines and hoisting machines. Excludes manually powered machines such as hand trucks and dollies, and power assisted machines such as electric wheelbarrows and hand trucks.

I. PRECISION WORKING

Using body members and/or tools, or work aids to work, move, guide, or place objects or materials in situations where ultimate responsibility for the attainment of standards occurs and selection of appropriate tools, objects, or material, and the adjustment of the tool to the task require exercise of considerable judgment.

J. SETTING UP

Adjusting machines or equipment by replacing or altering tools, jigs, fixtures, attachments, etc., to prepare them to perform their functions, change their performance or restore their proper functioning if they break down. Workers who set up one or a number of machines for other workers or who set up and personally operate a variety of machines are included here.

Note: Included in the concept of feeding-offbearing, tending, operating-controlling, and setting up is the situation in which the worker is actually himself part of the set-up of the machine, either as the holder and guider of the material or holder and guider of the tool.

Where a worker is an integral part of the machine functioning, either by reason of holding and guiding the material or holding and guiding the tool, the worker function should be interpreted as fundamentally a relationship to the machine-namely; he is either feeding-offbearing, tending, operating-controlling, or setting up. Determination as to which of these worker functions is appropriate will involve consideration of the variables described in the handling, manipulating, and precision working definitions, namely: latitude for judgment; selection of appropriate tool, object, or material, standards to be attained; responsibility involved.

"DATA" FUNCTIONS

K. COMPARING

Judging the readily observable functional, structural, or compositional characteristics (whether similar to or divergent from obvious standards) of things, data, or people.

L. COPYING

Transcribing, entering, or posting data.

M. COMPUTING

Performing arithmetic operations and reporting on and/or carrying out a prescribed action in relation to them. Does not include counting.

N. COMPILING

Gathering, collating, or classifying information about things, data, or people. Reporting and/or carrying out a prescribed action in relation to the information are frequently involved.

O. ANALYZING

Examining and evaluating data. Presenting alternative actions in relation to evaluation is frequently involved.

P. COORDINATING

Determining time, place, and sequence of operations, or action to be taken on basis of analysis of data; executing determinations and/or reporting on events.

Q. SYNTHESIZING

Integrating analyses of data to discover facts and/or develop knowledge concepts or interpretations.

"PEOPLE" FUNCTIONS

R. TAKING INSTRUCTIONS-HELPING

Attending to the work assignment instructions or orders of supervisors. (No immediate response required unless clarification of instruction or order needed.) Helping applies to "non-learning" helpers.

S. SERVING

Attending to the needs or requests of people or animals or expressed or implicit wishes of people. Immediate response involved.

T. SPEAKING-SIGNALLING

Talking, conversing with and/or signalling people to convey or exchange information. Includes giving assignments and/or directions to helpers or assistants.

U. PERSUADING

Influencing others in favor of a product, service, or point of view.

V. DIVERTING

Amusing others.

W. SUPERVISING

Determining or interpreting work procedure for a group of workers, assigning specific duties to them, maintaining harmonious relations among them, and promoting efficiency.

X. INSTRUCTING

Presenting subject matter to others, or training others (including animals) through explanation, demonstration, and supervised practice; or making (consulting) recommendations on the basis of technical disciplines (all workers engaged as consultants).

Y. NEGOTIATING

Exchanging ideas, information and opinions with others to formulate policies and programs and/or arrive jointly at decisions, conclusions, or solutions to problems.

Z. MENTORING

Dealing with individuals in terms of their total personality in order to advise, counsel and/or guide them with regard to their personal problems that may be resolved by legal, scientific, clinical, spiritual, and/or other professional principles.

"PROCEDURES", "METHOD" AND "SYSTEMS" [1]

As noted by Richard F. Neuschel (in "Management by System", McGraw-Hill Book Co., New York, 1960, Pages 9-10) the terms "system", "procedures", and "methods" are often used interchangeably, leading to problems of reference and semantics in describing the scope of systems work. Mr. Neuschel offers the following definitions which the author considers most precise and logical:

1. A procedure is a sequence of clerical operations, usually involving several people in one or more departments, established to insure uniform handling of a recurring transaction of the business. A procedure specifies, either in writing or by custom:

   a. What work is to be performed by the various participants
   b. Who these participants are
   c. When the various steps in the process are to be performed -- that is, their order and timing.

2. Clerical methods (or office methods), on the other hand, are the manual or mechanical means by which individual clerical operations are performed. Thus, "methods" have to do with how work is performed, not with what work is to be done, who will do it, or when. For example, messengers and pneumatic tubes are methods of transporting documents. Billing machines, automatic calculators and key-driven computers are mechanical methods of extending invoices. Punched-card equipment is a mechanical method of sorting, listing, and summarizing.

3. A system is a network of related procedures developed according to an integrated scheme for performing a major acitivity of the business. Thus the production-control system, for example, consists of scheduling procedures, material-requisitioning procedures, dispatching or routing procedures, progress-recording and control procedures, and so on. Similarly, the accounting and material-control systems each comprise many related procedures.

The installation of a unified system for the whole company, therefore, involves the combination or consolidation of these individual functional systems or networks of related procedures.

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[1] Quoted from "Management Information Systems and the Computer", by James D. Gallagher, American Management Association, Inc.

DEFINITIONS ADOPTED

Definitions proposed for use in the fourth edition of the Dictionary of Occupational Titles by the Milwaukee Occupational Analysis Field Center, and used in this study, include:

TASK:[1]	Any human effort, physical or mental, to accomplish a specific purpose.
POSITION:[1]	A collection of tasks and responsibilities constituting the total work assignment of a single worker. There are as many positions as there are workers in the country.
JOB:[1]	A group of similar positions in a single plant, business establishment, educational institution or other organization. There may be one or many persons employed in the same job.
OCCUPATION:[1]	A group of similar jobs found in several establishments.

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[1] Carroll L. Shartle, Occupational Information -- Its Development and Application, Third Edition, 1959, Page 23.

Section 3

LIMITATIONS OF CURRENT AUTOMATION RESEARCH

The fundamental climate of automation is not one of abrupt movement, and thus not one of mass layoffs or hiring. Instead, it is that of subtly changed relationships occurring on a broad front caused by improvements in existing technologies. Abrupt movements such as mass layoffs and hirings do occur, but they are the exception, not the rule. Ironically, abrupt changes are frequently all we can measure, and even these abrupt changes derive from subtle changes in relationships occurring over a period of time within a given firm or industry.

It is meaningless to project to a larger universe -- an industry or area -- the consequences of change occurring in a firm that has installed a computer or any other new method, system or procedure, unless the degree of change which released the consequences is also measured. The location in time and place or, in other words, the starting point of change in the observed sample case or cases, must be identified if we are to measure the degree of change which occurs in moving to a new location in time and place.

This and other automation research projects reveal some of the inadequacies of attempts to apply "traditional" linear concepts to relationships as a measure of change caused by technological innovation. In other words, the idea that change is always two-dimensional and absolutely predictable should be discarded. Also, the results of a change are affected by numerous intervening variables, hereinafter called factors, and are even less capable of being explained by using linear, "straight-line", analysis.

Location of time and place may be accomplished if we adopt measures with which to make reference when considering the specific firm, firms, or industry under study. The more specific the location in time and place desired, the more factors and gradations in the detail of factors required to obtain the more exact location. Below is given one factor which is useful in identifying time and place -- the factor of Sophistication of Work Methods.

What is the degree of sophistication of work method prior to change?

Generally, sophistication in clerical work methods proceeds along specific lines of advancement. That is, specific steps from the least to the most sophisticated methods can be scaled, and the results of changes forecast within a range of probability. Below is an abbreviated scale which is used in research and commentary on office methods.

Completely Manual	Mechanical	Electro-Mechanical	Electronic "Completely Automated"
(pencil and paper records production and manual computation)	(Manually actuated single-purpose machines, typewriters, adders, etc.)	(punch card as processing base, with partial integration of management data possible on tabulating machines)	(data capture in machine language at source, direct transfer to computer memory, "decision-making" by "self-optimizing" computer system, and total integration of management information as ultimate goals)

The problem is how to identify where an establishment is on the scale of work sophistication. In observing a particular firm, we may find that it may not be located at a single point on this scale. If our research reveals a specific work method of processing data in one segment of an establishment, it does not preclude that other levels of work method are not used in other segments of the establishment. Also, when any establishment uses more than one level of work method, an analysis of their relative distribution is necessary. When one or several steps in the scale of processing data are skipped when introducing more sophisticated work methods, it is always a reasonable assumption that the effects on personnel will be more dramatic.

Thus, several intervening variables arise when attempting to measure the results of only one factor of change -- sophistication of work methods. Other factors which produce additional variables are illustrated below. All bear a relationship to location of the starting point of change (time and place).

How efficient was the firm prior to the computer?

A scale of efficiency -- high, low, etc. -- helps identify a starting point from which to measure potential changes in efficiency level caused by the installation of a computer or by any other change in method, system, or procedure. Overall organizational efficiency and efficiency of various work units may vary. Thus, a scale can be applied to the individual work unit, establishment, establishments, or an industry as a whole, if a degree of variance exists.

How will the computer be used?

Will the computer be used as a bigger, faster calculating machine or as the core of an integrated management system -- or somewhere in between? Management's concept of what the machine is, will have much to do with its impact. This concept has been found to vary greatly. Even within one establishment, application concepts can vary between organizational units.

What is the firm's attrition rate?

A scale of attrition -- high, low, etc. -- helps identify a starting point from which to measure potential changes in personnel requirements, transfers, and so forth. When the attrition rates of affected units vary from the overall attrition rate, separate scales must be applied to individual units.

What will happen to agencies, branches, etc.?

Will work be pulled into the computer site (centralization of work) or will it be spread out from the computer site (decentralization of work)? In the case study of the insurance company, premium collection tasks were pulled into the home office (centralization), eliminating one hundred and fifty positions at company agencies. At the same time, some mortgage loan processing was moved into company branch mortgage loan offices (decentralization), giving some additional work to these branch offices. Thus establishments, industries, or individual units of establishments or industries, can require measurement on a scale of centralization versus decentralization.

Is work load increasing, decreasing, or stable?

If work load is increasing along with increases in productivity, either the same number of workers can handle increased volumes of work, or more workers are needed; however, if productivity is rising faster than work load, fewer workers will be needed.

If work load is stable or decreasing, increased productivity will result in a need for less workers. Obviously, a dimension using a scale "increasing", "stable", "decreasing" work load, with any desired intermediary gradations, is required to measure the relationship between change and the results of change. Again, since work load can vary independently in various units, it may be necessary to apply separate scales in these units.

What is the financial position of the firm?

Computers are expensive instruments. Financial resources can affect both the extent of use and area of application of the computer. Limitated financial resources can prevent the purchase or lease of large, general-purpose computer systems or stiffen opposition to this expenditure when management feels that available working capital should be used for other purposes. Financial institutions can require a separate scale from that of manufacturing industries because of differences in availability of funds, in tax status, inventory and product research and development expenditures, etc. Thus, a scale, or scales, -- adequate financial resources, limited financial resources, etc. -- can refine a projection attempting to predict the rate of utilization of new innovations.

How adequate is the supply of specialists that must be recruited?

The willingness to adopt new innovations can be reduced if the supply of specialists required to apply them is limited. If a firm is aware of recruitment difficulties experienced by other firms in obtaining computer programers, for example, the willingness to adopt the new innovations may cease. thus, a scale -- adequate supply of required personnel versus inadequate supply --

assists in locating the time and place of an industry which is a potential user of the new innovation.

Another possible scale may be -- What is the relative "trainability" of a firm's workers for positions when specialists cannot be recruited from outside?

How rigid -- that is, opposed to change -- is the company work force, especially management and supervisors?

If rigidity exists, the installation of a computer may be prevented or delayed. More likely, a small-scale system is selected that has relatively less impact on a work force than a large-scale, more expensive, more flexible system would have. Rigidity of line supervisors can obstruct conversion attempts.Thus, in any attempt to generalize from a case study, that case study has to scale the rigidity (flexibility versus inflexibility) of the case study and the universe to make any expansion meaningful.

What are the competitors doing?

If competitors are making similar innovations (to offer new, lower cost, or improved service or product), the advantage gained by the introduction of a computer or of any other change in methods, systems, and procedures, can be cancelled out. If competitors are not making similar innovations, the effects of an innovation can be forecast within a range of probability. Thus, a scale -- competitors automating versus competitors not automating, and in what direction and why -- reflects the impact of competitor action or inaction on the acceptance of the innovation.

These questions reveal intervening variables which became apparent in our research. They do not exhaust the number of possible variables that can bend a projection. There are many dependent variables involved in relating the extent of any one change to a given set of effects. When projecting this change to a larger universe, in the form of a prediction of what is to occur elsewhere, the consideration and weighing of this set of variables is too vast to permit meaningful projections without the use of computers themselves. Not to consider sufficient dimensions, and limit projections to straight line extension of observed change in two dimensional cause-effect relationships, will limit the usefulness or render most conclusions meaningless.

APPENDIX #2

MONTHLY HOME OFFICE EMPLOYMENT -- 1/57 - 12/63

MONTHLY TOTAL HOME OFFICE EMPLOYMENT

1/57 - 6/63

	Total Home Office Employment	Female Home Office Employees	Male Home Office Employees
1/57	1630	1037	593
2/57	1663	1068	595
3/57	1657	1061	596
4/57	1649	1055	594
5/57	1622	1032	590
6/57	1681	1061	590
7/57	1700	1108	592
8/57	1654	1066	588
9/57	1661	1075	586
10/57	1669	1084	585
11/57	1668	1068	600
12/57	1662	1072	590
1/58	1670	1071	599
2/58	1672	1074	598
3/58	1682	1083	599
4/58	1672	1075	597
5/58	1657	1064	593
6/58	1672	1079	593
7/58	1688	1091	597
8/58	1673	1076	597
9/58	1671	1073	598
10/58	1670	1073	597
11/58	1675	1077	598
12/58	1663	1067	596
1/59	1674	1078	596
2/59	1686	1091	595
3/59	1683	1086	597
4/59	1672	1078	594
5/59	1642	1049	593
6/59	1686	1087	599
7/59	1718	1124	594
8/59	1706	1107	599
9/59	1685	1090	595
10/59	1682	1086	596
11/59	1688	1091	597
12/59	1669	1074	595

	Total Home Office Employment	Female Home Office Employees	Male Home Office Employees
1/60	1657	1064	593
2/60	1696	1105	591
3/60	1695	1102	593
4/60	1686	1092	594
5/60	1655	1062	593
6/60	1749	1146	603
7/60	1776	1168	608
8/60	1758	1153	605
9/60	1739	1140	599
10/60	1746	1147	599
11/60	1743	1146	597
12/60	1745	1143	602
1/61	1753	1149	604
2/61	1773	1172	601
3/61	1788	1182	606
4/61	1794	1189	605
5/61	1811	1197	614
6/61	1815	1197	618
7/71	1816	1198	618
8/61	1806	1188	618
9/61	1812	1195	617
10/61	1802	1184	618
11/61	1802	INA	INA
12/61	1788	1172	616
1/62	1802	INA	INA
2/62	1816	INA	INA
3/62	1802	INA	INA
4/62	1774	INA	INA
5/62	1763	1155	608
6/62	1763	1155	608
7/62	1737	1129	608
8/62	1719	1126	593
9/62	1717	1124	593
10/62	1722	1115	607
11/62	1703	1115	588
12/62	1709	1119	590
1/63	1711	1120	591
2/63	1710	1120	590
3/63	1709	1119	590
4/63	1715	1123	592
5/63	1688	1105	583
6/63	1721	1127	594
7/63	1720	1127	593
8/63	1705	1117	588
9/63	1703	1115	588
10/63	1704	1116	588
11/63	1695	1105	590
12/63	1698	1112	586
	EMPLOYMENT PROJECTION		
3/64	1691	INA	INA

APPENDIX #3

DEPARTMENT AND DATA PROCESSING

STAFFING TABLES

The following tables list the compositions in the departments of the subject insurance company. Since only those areas that were affected by EDP were studied, staffing patterns are available for these divisions only. The number of persons staffing each division -- when known -- is indicated by the parenthesized number under each division title.

The staffing table of the Data Processing Department is included in this section because of the relevance of this department to our study. This table includes the DOT titles of persons in each department and the corresponding DOT code, plus a breakout of the number of individuals in each classification.

ESTABLISHMENT OF DIVISIONS IN THE DATA PROCESSING DEPARTMENT
3/1/63 - Clerical Employees *

Area which furnished staff and number (in parenthesis) of persons from each area.	New Division created and number (in parenthesis) of persons comprising the division.
Actuarial Department Tab. Service (30)	Tabulating Service Division (32)
Actuarial Department Loan & Surrender (1)	
Comptrollers Department Supplies & Services (1)	
Comptrollers Department Methods & Procedures (3)	Controls Division (7) **
Actuarial Department Secretarial (3)	
Actuarial Department Secretarial (7)	EDP Center (15)
Treasurers Department Unit #3 (1)	
Comptrollers Department Methods & Procedures (2)	
Outside Hiring: Tape Librarians (2) High Speed Printer Opr. (1) IBM 705 Program trainees-college graduates (2)	
Actuarial Department Secretarial (2)	EDP Systems and Programing (13)
Actuarial Department Mathematical (1)	
Comptrollers Department Methods & Procedures (7)	
Treasurers Department Auxiliary (1)	
Treasurers Department Unit #4 (1)	
Secretarial Department Death Claims (1)	

* See next page

** Transfer information not available on one employee.

DATA PROCESSING DEPARTMENT STAFFING TABLE
CLERICAL EMPLOYEES*
(One Month After Initial Establishment of Department)
3-31-61

TABULATING SERVICE DIVISION

DOT TITLE	DOT CODE	M	F	T
Manager, Office	0-97.12	1	-	1
Clerical Technician	0-69.97	2	-	2
Accounting Clerk	1-01.31	-	1	1
Bookkeeping Mach. Oper.	1-02.02	1	-	1
Key Punch Operator	1-25.62	-	9	9
Tab. Mach. Operator	1-25.64	8	7	15
Verifier	1-25.66	-	2	2
SUB TOTAL		12	19	31
INA**		-	1	1
TOTAL		12	20	32

CONTROLS DIVISION

DOT TITLE	DOT CODE	M	F	T
Research Writer	0-06.85	2	-	2
Manager, Office	0-97.12	1	-	1
Checker II	1-03.02	-	1	1
Messenger	1-23.14	-	1	1
Stock Clerk	1-38.01	-	1	1
Supervisor, D.P.S.	1-47.03	1	-	1
TOTAL		4	3	7

EDP CENTER DIVISION

DOT TITLE	DOT CODE	M	F	T
Tape Librarian	1-20.04	3	-	3
Console Operator	1-25.17	4	-	4
Card-Tape-Converter Oper.	1-25.60	1	-	1
High-Speed-Printer Oper.	1-25.98	5	-	5
Secretary	1-33.01	-	2	2
TOTAL		13	2	15

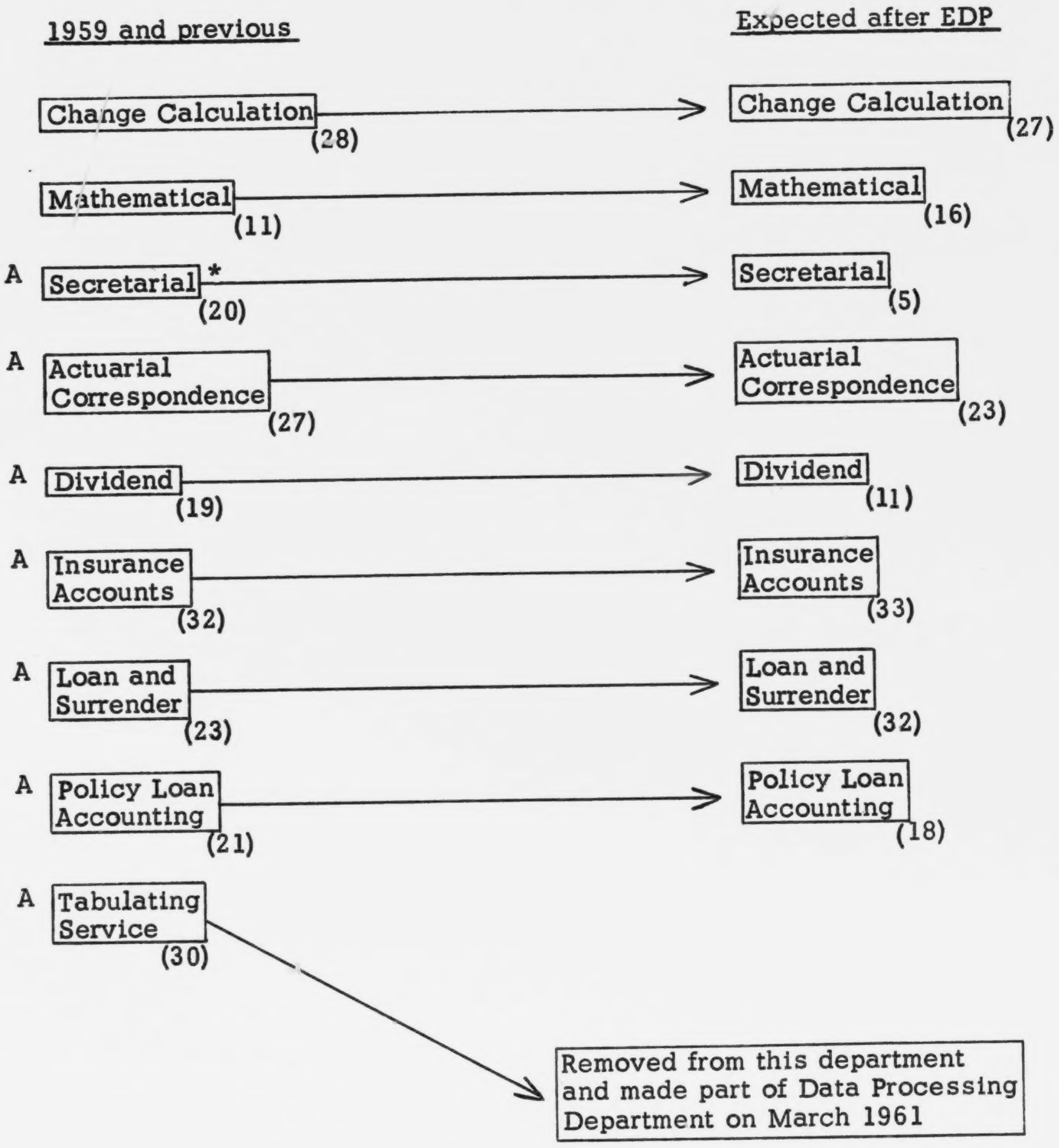
* Excluding positions considered managerial and professional (company definition)

** Information not available on one female employee classified as doing routine clerical work.

SYSTEMS AND PROGRAMING DIVISION

DOT TITLE	DOT CODE	M	F	T
Programer (Instructor)	0-69.981	-	1	1
Programer (Statistics Compiler)	0-69.981	1	-	1
Programer	0-69.981	6	5	11
TOTAL		7	6	13

CHANGES IN DIVISIONS OF THE ACTUARIAL DEPARTMENT


1959 and previous
Expected after EDP
Change Calculation (28)
Change Calculation (27)
Mathematical (11)
Mathematical (16)
A Secretarial * (20)
Secretarial (5)
A Actuarial Correspondence (27)
Actuarial Correspondence (23)
A Dividend (19)
Dividend (11)
A Insurance Accounts (32)
Insurance Accounts (33)
A Loan and Surrender (23)
Loan and Surrender (32)
A Policy Loan Accounting (21)
Policy Loan Accounting (18)
A Tabulating Service (30)
Removed from this department and made part of Data Processing Department on March 1961

* Decline due to removal of functions and 16 personnel to the data processing department.

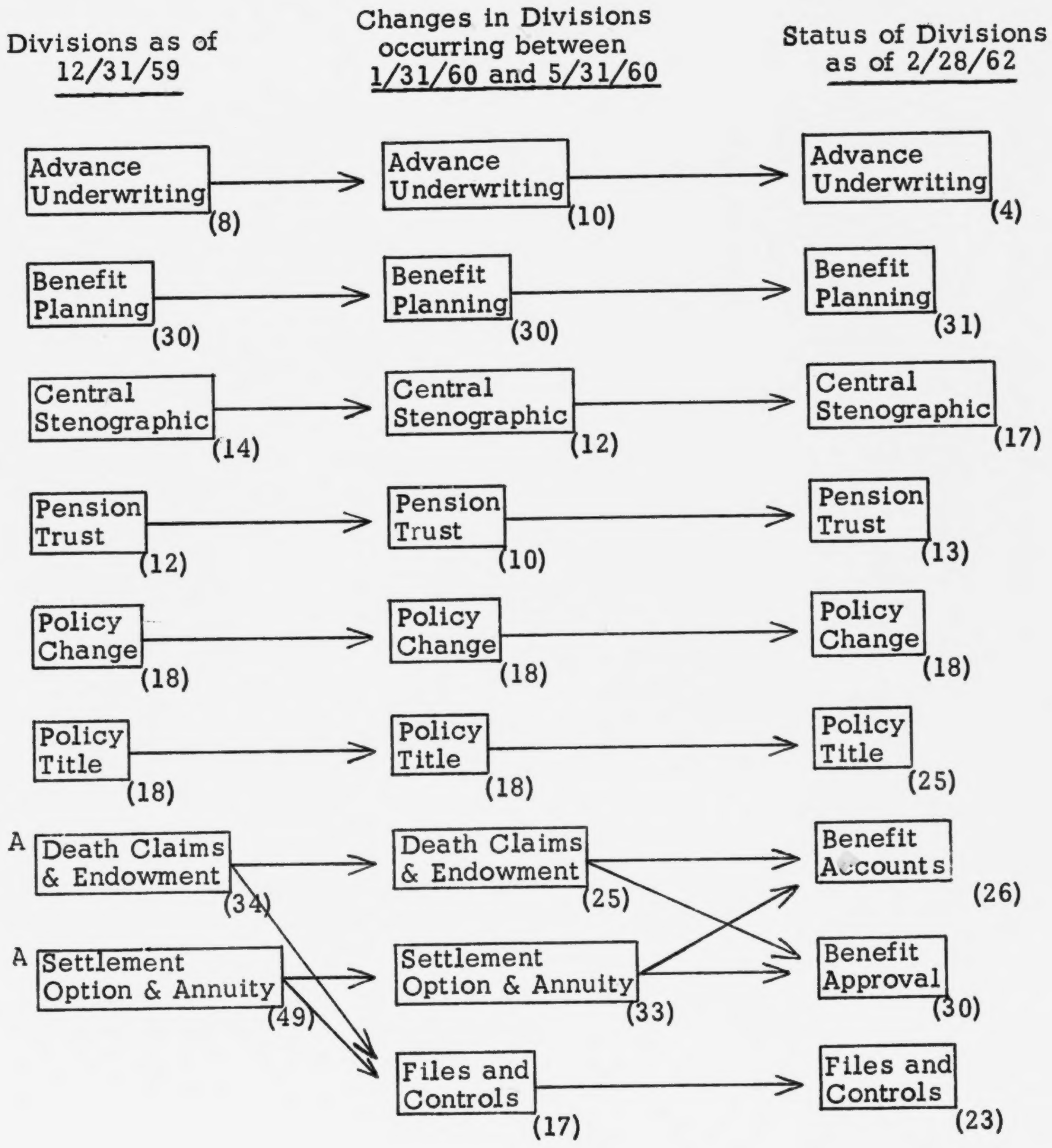
A - Division affected by EDP.

CHANGES IN DIVISIONS OF THE MORTGAGE LOAN DEPARTMENT

	Prior to EDP 12/31/54	Full Staffing After EDP
	Closing Loans and Abstracts (34)	Mortgage Closing (32)
	Miscellaneous (4)	Mortgage Services (2)
	Vice Presidents Office (1)	Vice Presidents Office (1)
	City Loans and Real Estate (4)	Commercial Mortgages (5)
	Farm Loans and Real Estate (2)	Farm Mortgages (3)
	Residence Loans and Real Estate (7)	Resident Mortgages (6)
A	Bookkeeping (27)	Mortgage Accounting (17)
A	Mortgage Servicing (56)	Mortgage Servicing (36)
	Finance Committee * (6)	
	Vault * (8)	

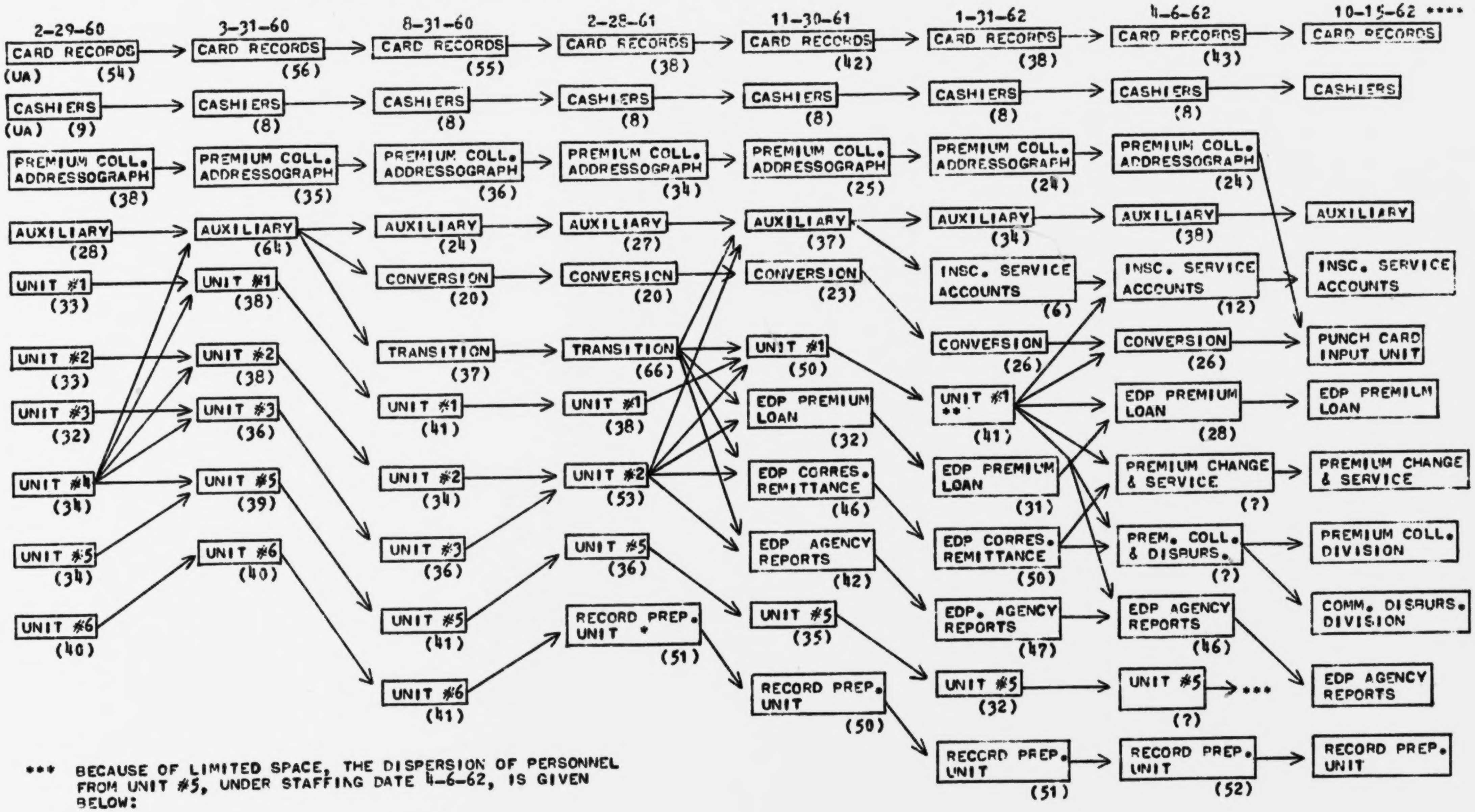
* Discontinued.
A - Division affected by EDP.

CHANGES IN DIVISIONS OF THE SECRETARIAL DEPARTMENT

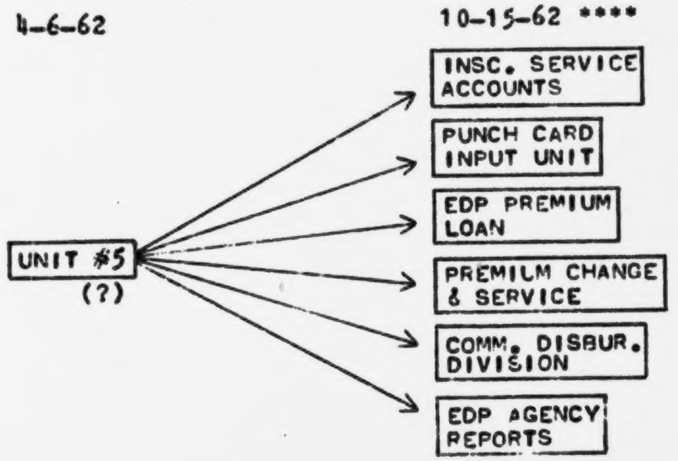

Divisions as of 12/31/59
Changes in Divisions occurring between 1/31/60 and 5/31/60
Status of Divisions as of 2/28/62
Advance Underwriting (8)
Advance Underwriting (10)
Advance Underwriting (4)
Benefit Planning (30)
Benefit Planning (30)
Benefit Planning (31)
Central Stenographic (14)
Central Stenographic (12)
Central Stenographic (17)
Pension Trust (12)
Pension Trust (10)
Pension Trust (13)
Policy Change (18)
Policy Change (18)
Policy Change (18)
Policy Title (18)
Policy Title (18)
Policy Title (25)
A Death Claims & Endowment (34)
Death Claims & Endowment (25)
Benefit Accounts (26)
A Settlement Option & Annuity (49)
Settlement Option & Annuity (33)
Benefit Approval (30)
Files and Controls (17)
Files and Controls (23)

A - Division affected by EDP.

MAJOR STRUCTURAL CHANGES IN DIVISIONS OF THE TREASURER'S DEPARTMENT


2-29-60
CARD RECORDS (UA) (54)
CASHIERS (UA) (9)
PREMIUM COLL. ADDRESSOGRAPH (38)
AUXILIARY (28)
UNIT #1 (33)
UNIT #2 (33)
UNIT #3 (32)
UNIT #4 (34)
UNIT #5 (34)
UNIT #6 (40)
3-31-60
CARD RECORDS (56)
CASHIERS (8)
PREMIUM COLL. ADDRESSOGRAPH (35)
AUXILIARY (64)
UNIT #1 (38)
UNIT #2 (38)
UNIT #3 (36)
UNIT #5 (39)
UNIT #6 (40)
8-31-60
CARD RECORDS (55)
CASHIERS (8)
PREMIUM COLL. ADDRESSOGRAPH (36)
AUXILIARY (24)
CONVERSION (20)
TRANSITION (37)
UNIT #1 (41)
UNIT #2 (34)
UNIT #3 (36)
UNIT #5 (41)
UNIT #6 (41)
2-28-61
CARD RECORDS (38)
CASHIERS (8)
PREMIUM COLL. ADDRESSOGRAPH (34)
AUXILIARY (27)
CONVERSION (20)
TRANSITION (66)
UNIT #1 (38)
UNIT #2 (53)
UNIT #5 (36)
RECORD PREP. UNIT * (51)
11-30-61
CARD RECORDS (42)
CASHIERS (8)
PREMIUM COLL. ADDRESSOGRAPH (25)
AUXILIARY (37)
CONVERSION (23)
UNIT #1 (50)
EDP PREMIUM LOAN (32)
EDP CORRES. REMITTANCE (46)
EDP AGENCY REPORTS (42)
UNIT #5 (35)
RECORD PREP. UNIT (50)
1-31-62
CARD RECORDS (38)
CASHIERS (8)
PREMIUM COLL. ADDRESSOGRAPH (24)
AUXILIARY (34)
INSC. SERVICE ACCOUNTS (6)
CONVERSION (26)
UNIT #1 ** (41)
EDP PREMIUM LOAN (31)
EDP CORRES. REMITTANCE (50)
EDP. AGENCY REPORTS (47)
UNIT #5 (32)
RECORD PREP. UNIT (51)
4-6-62
CARD RECORDS (43)
CASHIERS (8)
PREMIUM COLL. ADDRESSOGRAPH (24)
AUXILIARY (38)
INSC. SERVICE ACCOUNTS (12)
CONVERSION (26)
EDP PREMIUM LOAN (28)
PREMIUM CHANGE & SERVICE (?)
PREM. COLL. & DISBURS. (?)
EDP AGENCY REPORTS (46)
UNIT #5 (?) ***
RECORD PREP. UNIT (52)
10-15-62 ****
CARD RECORDS
CASHIERS
AUXILIARY
INSC. SERVICE ACCOUNTS
PUNCH CARD INPUT UNIT
EDP PREMIUM LOAN
PREMIUM CHANGE & SERVICE
PREMIUM COLL. DIVISION
COMM. DISBURS. DIVISION
EDP AGENCY REPORTS
RECORD PREP. UNIT

*** BECAUSE OF LIMITED SPACE, THE DISPERSION OF PERSONNEL FROM UNIT #5, UNDER STAFFING DATE 4-6-62, IS GIVEN BELOW:


4-6-62
10-15-62 ****
UNIT #5 (?)
INSC. SERVICE ACCOUNTS
PUNCH CARD INPUT UNIT
EDP PREMIUM LOAN
PREMIUM CHANGE & SERVICE
COMM. DISBUR. DIVISION
EDP AGENCY REPORTS

FOOTNOTES:

* UNIT RENAMED ON 1-31-61

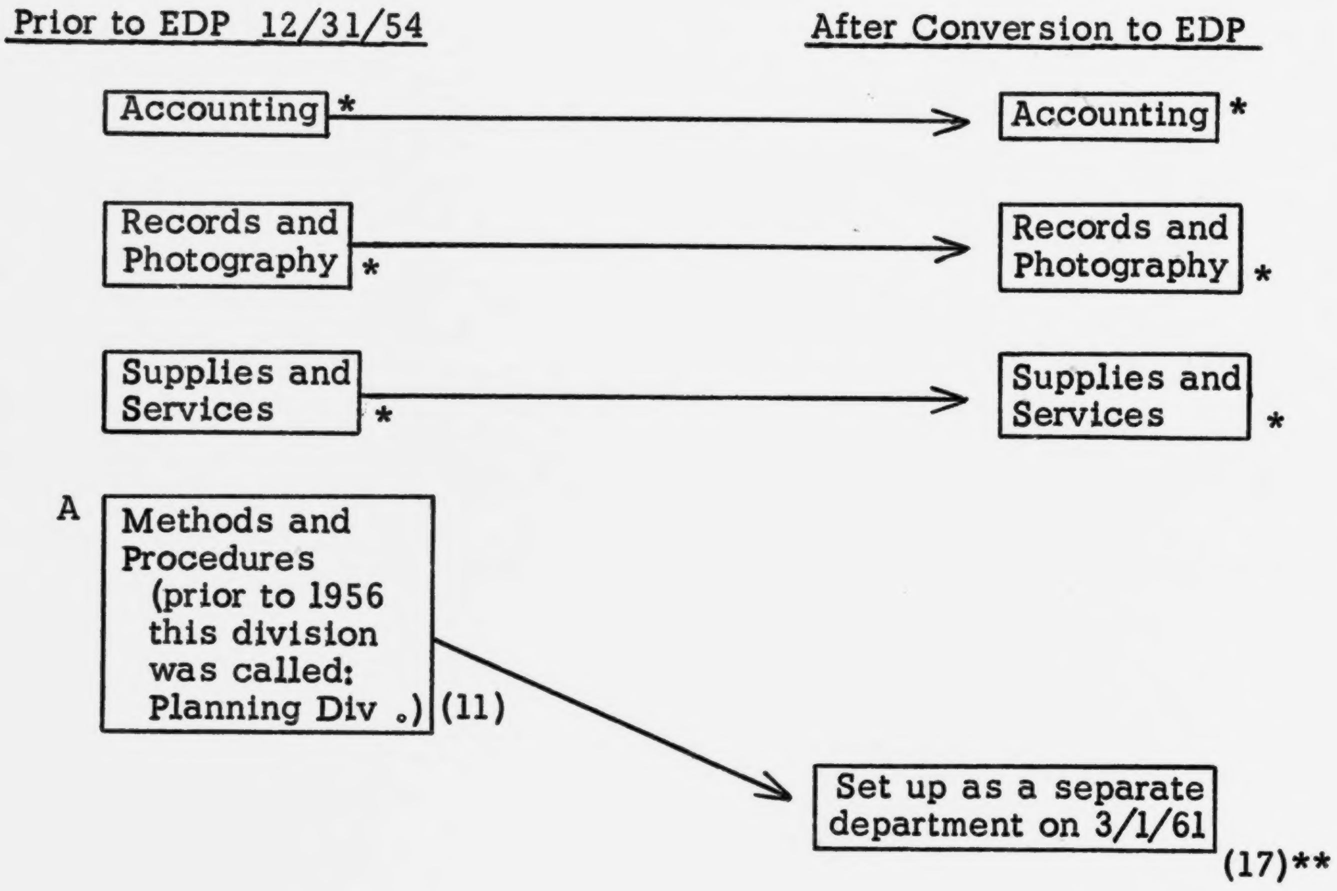
** UNIT DISCONTINUED ON 3-31-62

*** UNIT DISCONTINUED ON 9-30-62, SEE PERSONNEL DISPERSION OF THIS UNIT AS SHOWN AT LEFT.

**** STAFFING PATTERNS OF THIS DATE ARE NOT KNOWN.

(UA) DIVISION UNAFFECTED BY EDP.
STUDY BEING MADE ON CONVERTING CARD RECORDS TO EDP.

DIVISIONS IN THE COMPTROLLERS DEPARTMENT


Prior to EDP 12/31/54
After Conversion to EDP
Accounting *
Accounting *
Records and Photography *
Records and Photography *
Supplies and Services *
Supplies and Services *
A
Methods and Procedures (prior to 1956 this division was called: Planning Div.) (11)
Set up as a separate department on 3/1/61
(17)**

METHODS AND PROCEDURES DEPARTMENT

(Set up as a separate department on 3/1/61; it contains no separate divisions).

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* Staffing patterns were not compiled for divisions not affected by EDP.
** Had built up to a staffing of 27 in 1961.
A - Division affected by EDP.

DEPARTMENTS WHICH HAD VIRTUALLY NO CHANGE IN DIVISIONS (1959 to 1962)

Divisions prior to 1959	Divisions as of 1962

AGENCY DEPARTMENT

No separate divisions

BOND SECURITIES DEPARTMENT

Divisions prior to 1959		Divisions as of 1962
Operating	→	Operating
Research	→	Research

LAW DEPARTMENT

No separate divisions

MEDICAL DEPARTMENT

No separate divisions

PERSONNEL DEPARTMENT

No separate divisions

PRESIDENTS DEPARTMENT

No separate divisions

UNDERWRITING DEPARTMENT

Divisions prior to 1959		Divisions as of 1962
Lay Underwriting	→	Lay Underwriting
Miscellaneous	→	Miscellaneous
Policy	→	Policy
Service & Controls	→	Service & Controls

Note: Since these departments were unaffected by EDP, no staffing patterns were taken.